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[JOINT COMMITTEE PRINT]

TAX POLICY AND THE MACROECONOMY: STABILIZATION, GROWTH, AND INCOME DISTRIBUTION

SCHEDULED FOR HEARINGS

BEFORE THE

HOUSE COMMITTEE ON WAYS AND MEANS

ON DECEMBER 17-18, 1991

PREPARED BY THE STAFF

OF THE

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INTRODUCTION

This pamphlet,[1] prepared by the staff of the Joint Committee on Taxation, provides a discussion of tax policy effects on the economy, including short-term stabilization, long-term economic growth, and income distribution.

Part I of the pamphlet is an executive summary of the points discussed in Parts II-VI. Part II provides background data on the U.S. economy. Part III is a discussion of what fiscal policy can do generally. Part IV is a discussion of fiscal policy effects on short-run fluctuations in aggregate demand. Part V discusses the effects of certain tax policies on aggregate supply. Part VI discusses the effects of fiscal policy on income distribution. The Appendix provides tables on various related economic data.

[1] This pamphlet may be cited as follows: Joint Committee on Taxation, *Tax Policy and the Macroeconomy: Stabilization, Growth, and Income Distribution* (JCS-18-91), December 12, 1991.

I. SUMMARY

Observers have expressed three concerns about the performance of the United States economy: (1) the increase in unemployment and reduction in real output experienced by the economy since July 1990; (2) the relatively low growth rates of productivity, saving, investment, and real wages since 1970; and (3) the trends in the distribution of income in the past decade.

Short-run economic performance

By unemployment and capacity utilization measures, the economic decline of the past year has been modest. The November 1991 unemployment rate of 6.8 percent, down from a one-month peak of 7.0 percent in June, is less than the average annual unemployment rate from 1971 through 1980. The recent decline in capacity utilization is also slight in comparison to prior periods of recession. In terms of gross national product ("GNP") lost by not being at full employment, the most recent recession has not been nearly as costly as the 1982 or 1974 recessions. The duration of the decline, however, may be slightly longer than the postwar average recession of 11 months.

Long-run economic performance

Trends in the growth of wages and output suggest that it may be difficult for the United States to maintain a high and growing standard of living for its residents in the future. Many other countries have experienced higher rates of income growth than has the United States. Real per capita gross domestic product ("GDP") growth in the United States averaged less than 1.8 percent per year from 1969 to 1988, compared to 2.2 percent for the United Kingdom, 2.9 percent for Canada, and 4.1 percent for Japan. Low rates of investment and even lower rates of saving may explain some of the decline in the relative position of the United States economy.

Possible policy choices

Policies targeted to increasing aggregate supply are designed to augment the capacity of the economy to produce goods and services, increasing potential GNP and thus the long-run output possibilities for the economy. Policies targeted to increasing aggregate demand are designed to move the economy closer to full employment of currently available resources.

If long-run decline in the economy's standard of living is seen as the major problem, then policy ought to be directed toward increasing aggregate supply. If the current economic downturn is seen to be the problem rather than sluggish long-run growth of the economy, then policies targeted to increasing aggregate demand are appropriate. One needs to be clear about the ills to be attacked be-

cause some policies aimed at improving the short-run performance of the economy may have deleterious effects on long-run growth and vice versa.

Aggregate demand policies

A well-known prescription (termed "Keynesian policy") for addressing an economy in recession is to stimulate aggregate demand by increasing government spending or reducing taxes. Many economists now doubt the efficacy of such policy, and the current size of the Federal deficit relative to GNP may limit such policy, even if one were otherwise inclined to use it.

A tax cut that is financed with cuts in government spending or increases in other taxes will have at most a small effect on aggregate demand. A tax cut that is financed with cuts in government spending could make the current slowdown slightly worse; because the households save some portion of their tax benefit, the increase in spending by households does not entirely offset the reduction in spending by the government. A tax cut for lower-income people that is financed by a tax increase on higher-income people might increase aggregate demand slightly, because lower-income people are likely to spend almost all of their tax cut, whereas higher-income people are likely to pay for some of their tax increase by reducing saving.

A practical problem with using discretionary fiscal policy involves the timing of policy changes. Macroeconomic indicators are difficult to interpret and implementation of macroeconomic policies is imprecise. Therefore, even if fiscal policy can be justified theoretically, difficulties in its practical implementation may greatly limit its usefulness as an anti-recessionary policy. Potentially lengthy lags can easily put the effects of a fiscal stimulus enacted in response to a recession well into the period of economic recovery. In such a case, demand stimulus may be destabilizing and inflationary.

Aggregate supply policies

Tax policies may be able to increase an economy's aggregate supply by increasing the economic return to working, saving, and investing. However, the effects of aggregate supply incentives on private behavior are often ambiguous. Payroll and income tax cuts have a theoretically ambiguous impact on work effort and hence on productive capacity. By increasing the return on the margin, tax cuts may induce consumers to increase work effort or saving and may induce firms to increase investment. However, because tax cuts generally increase the overall return to working or saving, they also increase the income of consumers. This increased income may lead to reduced labor supply and increased consumption, the opposite of the marginal effects of the tax cuts.

Because national saving is equal to the sum of government and private saving, judgments concerning the efficacy of aggregate supply policies must take into account the effects of such policies on both private and public saving.

Income distribution trends

Income growth in the United States has slowed considerably since the mid-1970s, compared to the rate of growth in the previous 25 years. Moreover, the degree of income inequality has also increased, especially since the mid-1970s.

Overall, the Federal tax system is progressive, in that the burden (measured by average tax rates—total taxes paid divided by total income) imposed on higher-income individuals tends to be larger than that imposed on lower-income individuals. However, the degree of progressivity of the Federal tax system appears to have declined in the last 10 to 15 years.

The evidence indicates that the Federal tax system acts to reduce the degree of pre-tax income inequality. But the impact of the Federal tax system is not large enough to offset completely the growing income inequality in the United States. Federal transfer programs are significantly progressive; they increase the progressivity of the overall Federal tax and transfer system.

II. TRENDS IN THE UNITED STATES ECONOMY IN THE SHORT RUN AND LONG RUN

A. Overview

Many observers have expressed concern about the performance of the United States economy. However, these observers differ as to the object of concern. There are three broad areas of concern. First, some observers are concerned about the increases in unemployment and reduction in real output experienced by the economy since July 1990. This may be characterized as concern about the short-run performance of the economy. Second, others are concerned about the relatively low rates of saving, investment, and real wage growth since 1970. Because saving and investment help determine the economy's potential for future employment and production, this may be characterized as concern about the long-run performance of the economy. Finally, others are concerned about the distribution of income in the economy. This is a concern not about the present or future level of output generated by the economy, but about the distribution of that output among individuals.

In general terms, aggregate output and the price level of that output result from the interaction of the nation's aggregate demand for goods and services and the nation's aggregate supply for producing goods and services.[2] In the short run, the economy's capacity often is fixed. It is not possible to make more than marginal additions to the economy's supply of physical capital (e.g., the stock of land, buildings, and machinery) in the short term. As a consequence, policymakers generally emphasize policies that affect aggregate demand when they are concerned about short-run economic performance. Such policies might include tax changes designed to alter consumer demand for consumption goods or business demand for new plant and equipment increased government expenditures, or monetary policies designed to reduce interest rates to encourage consumer and business borrowing.

In the long run, aggregate supply is variable. Policymakers concerned about future economic performance generally emphasize policies that increase aggregate supply in the long run. Such policies might include altering the level of the government surplus or deficit, or changing tax policy to alter consumer and business saving behavior.[3]

To the extent unrestrained market forces lead to a severely unequal distribution of income, policymakers may use the tax and transfer systems to affect the ultimate distribution of society's re-

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[2] Parts III, IV, and V of this pamphlet discuss aggregate demand and aggregate supply in more detail.

[3] Policies may affect both aggregate demand or aggregate supply. For example, policies that affect current business demand for new plant and equipment might alter both current aggregate demand and long-run aggregate supply.

sources. Analysts are able to measure the degree of inequality. However, there is little agreement as to what represents an optimal distribution of income.

This part of the pamphlet reviews data on the short-run and long-run economic performance of the American economy as well as data examining the pre-tax distribution of income. The data on short-run economic performance emphasize comparison of selected macroeconomic variables to previous periods of recession in the postwar era and show that the most recent recession, while it ultimately may be determined to be longer than the average postwar recession, has been less severe in many respects than previous recessions. The data on long-run economic performance include comparisons to similar data for other countries. These data indicate that the supply capacity of the United States has been growing less rapidly than that of other countries. The data on the distribution of income examine primarily the pre-tax distribution of income. As shown in Part VI, these data do not differ substantially from information on the after-tax distribution of income.

B. Short-Run Economic Performance

No precise definition of "recession" exists in economics.[4] Analysts frequently designate periods as recessions by comparing many measures of economic activity to their levels in other periods. As a consequence, analysts examine many variables to ascertain if the economy is in recession. Among variables commonly examined are the rate of growth of real gross national product (GNP), the unemployment rate, the capacity utilization rate, the inflation rate, and interest rates. Moreover, because multiple variables are compared, some measures of economic performance in periods deemed to be recessions may surpass the same measures from another time period when the economy was not deemed to have been in recession.

Growth of real GNP

Figure 1 details the rate of real GNP growth [5] over much of the post-World War II period.[6] The figure reveals that the declines in real GNP recently experienced are modest in comparison to the recessions of 1981-82 or 1974-75.

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[4] A definition of a recession as two consecutive quarters of negative growth in real GNP is commonly, albeit mistakenly, attributed to the National Bureau of Economic Research. The National Bureau of Economic Research is a non-profit research organization whose object is to ascertain and to present to the public important economic facts and their interpretations in a scientific and impartial manner. The National Bureau of Economic Research Business Cycle Dating Committee decides turning points by looking at a variety of indicators, not solely GNP. In particular, GNP is a quarterly concept, while peaks and troughs are monthly (see Table 1 in text). Consequently, identifying peaks and troughs involves professional judgments.

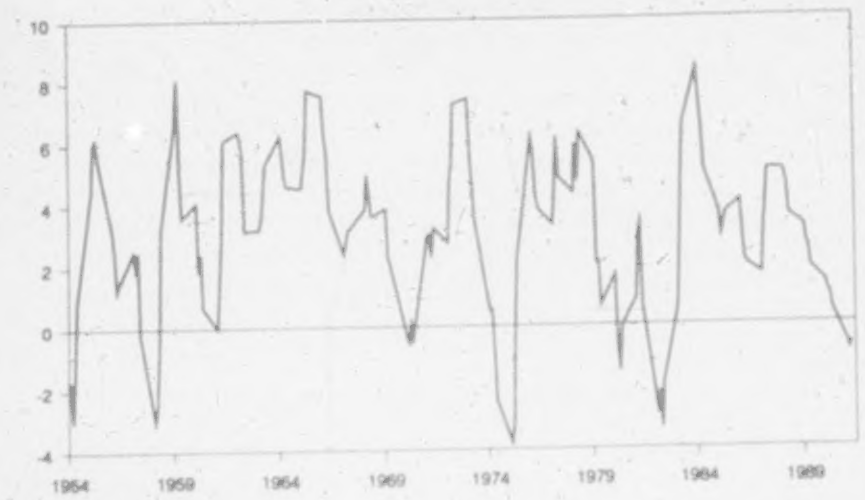
However, the definition of two consecutive quarters of decline in real GNP represents a fairly accurate description of a rule of thumb used by economists to identify recessions.

[5] When there is inflation, nominal or current dollar GNP may continue to rise while real or constant dollar GNP declines. Real GNP represents the constant dollar value of goods and services produced in the economy. Declines in real GNP represent declines in real output.

[6] Figure 1 measures the growth rate as the rate of change in real GNP from the level of GNP prevailing four quarters earlier. Supporting data are in the Appendix.

Figure 1

Growth Rate of Real GNP
1954-1991



Four quarters previous annual change
As calculated by Joint Committee Staff

According to the National Bureau of Economic Research's commonly accepted dating of business cycles, eight recessions occurred in the post-World War II era prior to 1990. Excluding the economic downturn accompanying the de-mobilization following the Korean War, the number of peacetime recessions is seven. Table 1 lists these recessions.

The National Bureau of Economic Research measures the length of recessions by reference to the number of months between the peak of real GNP prior to its subsequent decline and the subsequent trough in the level of real GNP. Table 1 follows this convention in presenting the duration of post-World War II recessions. By this peak-to-trough measure, recessions in the postwar period have averaged 11 months in duration. The National Bureau of Economic Research has identified a peak in July 1990 and the Department of Commerce reported positive real GNP growth in the second quarter of 1991. The National Bureau of Economic Research has yet to date the trough of the most recent recession. Consequently, a precise measure of the duration of the most recent recession cannot be made at the present time.

Table 1.—Post-World War II Recessions in the United States

Peak [1]	Trough [1]	Duration in months
November 1948	October 1949	11
July 1953	May 1954	10
August 1957	April 1958	8
April 1960	February 1961	10
December 1969	November 1970	11
November 1973	March 1975	16
January 1980	July 1980	6
July 1981	November 1982	16
July 1990	[2]	[2]
Average		11

[1] Peaks and troughs as identified by the National Bureau of Economic Research.
[2] Not determined.

Source: United States Department of Commerce, *Survey of Current Business*, 71, October 1991, p. C-45.

Unemployment and capacity utilization

As noted above, economists typically do not rely on a single measure of economic activity to gauge whether the economy is in recession. For example, increases in unemployment generally accompany declines in real GNP, but positive real GNP growth need not immediately be followed by a reduction in unemployment. Unemployment usually remains high during the beginning of the recovery period.[7] As a consequence, the peak-to-trough of real GNP measure may not correspond to the popular perception of recession based on unemployment.

Figure 2 reports both the civilian unemployment rate and the Federal Reserve's capacity utilization rate.[8] The latter measures the level of employment of the economy's capital resources in manufacturing and mining. The recessions of 1949, 1954, 1959, 1962, 1974, and 1982 are reflected clearly by the spikes in the civilian unemployment rate. These recessions also were accompanied by downward spikes in the capacity utilization rate. By these measures, the economic decline of the past year has been modest. The November 1991 unemployment rate of 6.8 percent, down from a one-month peak of 7.0 percent in June 1991, is less than the average annual unemployment rate from 1971 through 1980 of 7.0 percent. The recent decline in capacity utilization also is slight in comparison to prior periods of recession.

Figure 2 also displays two long-term trends. The average unemployment rate since 1975 generally has exceeded that of the first 25 years after World War II. Similarly the peaks in capacity utilization appear lower than those in earlier years.

[7] The measured unemployment rate is computed by dividing the number of individuals who are not employed, but who they are actively seeking employment, by the total labor force both employed and unemployed. Individuals who are out of work but who ceased actively to seek employment are called "discouraged workers." Discouraged workers are not counted as part of the labor force.

Individuals who have moved from full-time to part-time employment are counted as employed. For these two reasons, the unemployment rate may not be the most accurate single measure of job loss. However, this measure has been consistently applied across all postwar recessions.

[8] The capacity utilization rate is equal to the index of current industrial production divided by a capacity index. The capacity index attempts to measure "practical" capacity, that is, the greatest level of output that plants can maintain within a framework of a realistic work schedule, taking account of normal downtime, and assuming sufficient availability of inputs to operate the machinery and equipment in place. Thus, the capacity utilization rate may be thought of as a measure of idle factories and mines.

Figure 2

Unemployment/Capacity Utilization 1948-1991

Unempl. Rate: Department of Labor, Bureau of Labor Statistics
Capacity Util: Federal Reserve System

The unemployment rate reported in Figure 2 is the national unemployment rate. National figures may mask important regional differences. Figures 3a, b, and c report regional unemployment rates for the third quarter of 1980, the fourth quarter of 1982 (reflecting the two most previous recessions), and the third quarter of 1991 (reflecting the current recession) by region. The figures show that regional composition of unemployment in 1991 is different from that in either 1980 or 1982.

The 1991 recession has been characterized by a more even distribution of unemployment than either the 1980 or 1982 recessions when one examines unemployment rates. The average percentage deviation of all regional unemployment rates from the national unemployment rate was 14.7 percent for 1980, 15.9 percent for 1982, and 10.9 percent for 1991.

Unemployment rates may not accurately reflect the disparate effect of the most recent economic downturn. For example, while Figure 3c indicates that the New England region's unemployment rate (7.85 percent) exceeds that of the Great Lakes region (6.60 percent), the New England region's unemployment rate prior to 1990 was less than that of the Great Lakes region. Arguably the New England region has experienced a greater decrease in employment due to the recent economic downturn. An analysis by the Federal Reserve Bank of San Francisco divides the 50 States and the District of Columbia into five groups of approximately equal populations where the groups are defined by the amount of job losses in

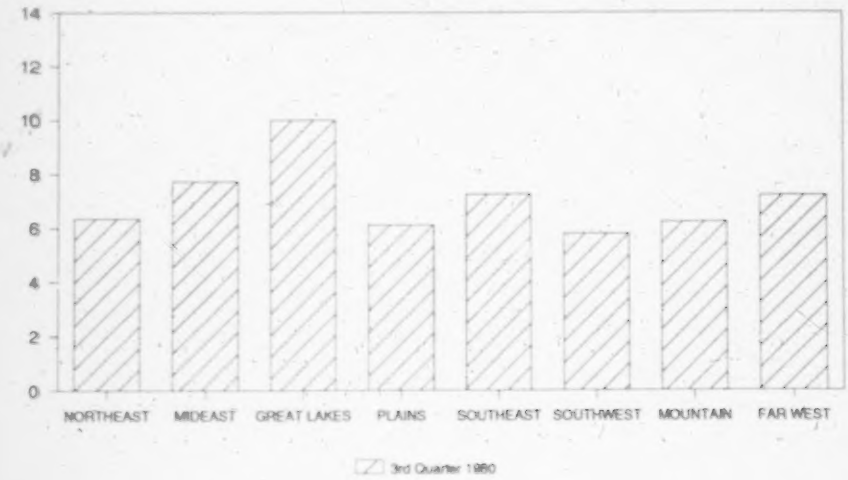
each State. The first quintile is those States (containing 20 percent of the United States population) where the largest job losses have occurred. The second quintile is those States (containing 20 percent of the United States population) where the next largest job losses have occurred, etc. This study has calculated that 59 percent of job losses occurred among the first quintile of the population living in those States most severely affected by job loss during the recession, while the fourth and fifth quintiles of the population living in States least affected have suffered relatively little job loss. By this measure, the concentration of job loss in the first quintile is greater by 10 percentage points than that experienced in any of the preceding seven recessions.[9]

[9] Cromwell, Brian. "The Regional Concentration of Recessions," *FRBSF Weekly Letter*, November 15, 1991. The 20 percent of the population residing in States most severely affected (the first quintile) reside in Massachusetts, Maine, New Hampshire, Rhode Island, Vermont, New Jersey, Connecticut, Michigan, the District of Columbia, and New York.

The 20 percent of the population residing in States least affected (the fifth quintile) reside in Kentucky, Mississippi, Wyoming, Louisiana, New Mexico, Texas, Oregon, Montana, Hawaii, Nevada, North Dakota, Arizona, Colorado, South Dakota, Arkansas, Idaho, Utah, and Nebraska.

Figure 3a

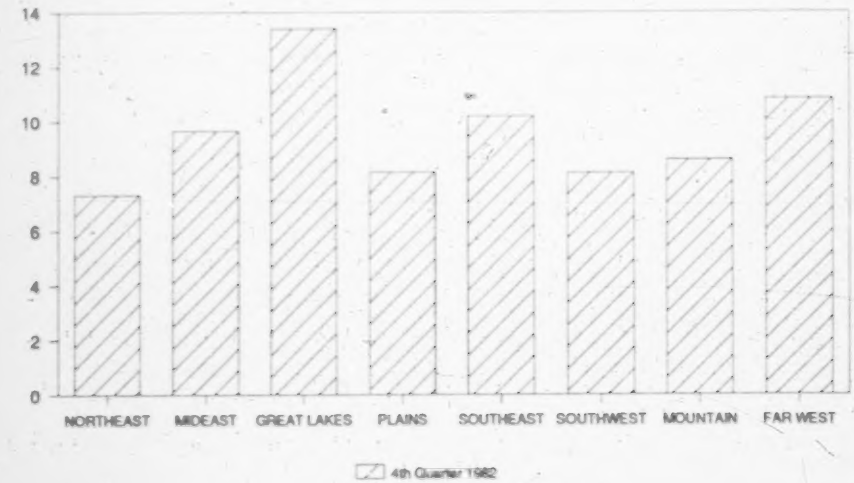
Regional Unemployment
3rd Quarter 1980



Department of Labor,
Bureau of Labor Statistics

Figure 3b

Regional Unemployment
4th Quarter 1982



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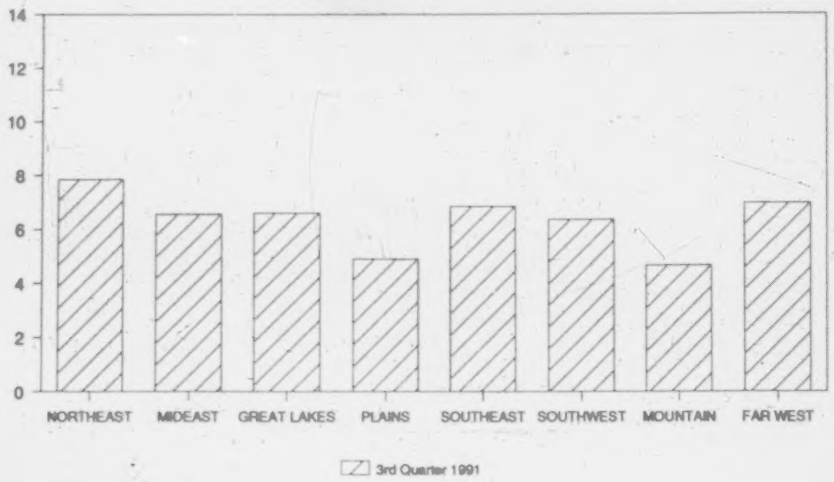
Bureau of Labor Statistics

Figure 3c

Regional Unemployment 3rd Quarter 1991



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Bureau of Labor Statistics

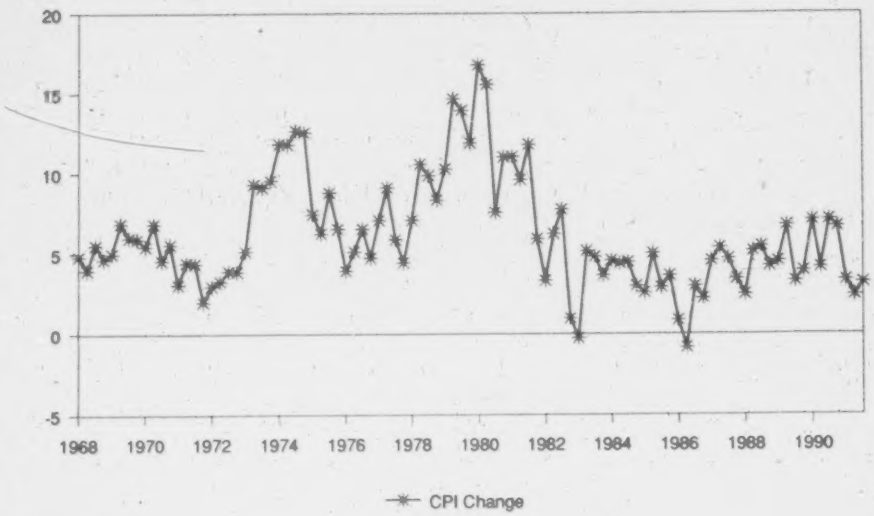
Inflation rate

Different rates of inflation also have characterized the various post-World War II recessions. While the inflation rate of 1990, and at present, is low compared to the experience of the 1970s, it is high when compared to periods prior to 1973. It is also higher than the rate of inflation experienced during the nation's most recent previous recession, when inflation as measured by the change in the consumer price index equalled a rate of 3.8 percent for 1982. Figure 4 displays the inflation rate for the postwar period.[10]

[10] Inflation in Figure 4 is measured by the quarter-to-quarter change in the Consumer Price Index through the second quarter of 1991. Supporting data are in the Appendix.

Figure 4

Inflation, 1968-1991



Department of Labor,
Bureau of Labor Statistics

Interest rates

Many economists view the role of aggregate demand in the economy as important in determining the depth and length of an economic downturn. Thus, economists analyze consumer spending and business investment spending when interpreting the economy's aggregate performance. For purchases such as homes and automobiles where the consumer often borrows funds to finance the purchase, the level of interest rates can be an important determinant of total cost and, consequently, an important determinant of aggregate consumer demand. Of course, interest costs also are important to business investment decisions and, thus, have an additional effect on aggregate demand in the economy.

It is important to distinguish nominal interest rates from real interest rates. A real interest rate is the inflation-adjusted interest rate. Economists stress that because consumers and businesses pay off loans with nominal dollars, that is, with dollars that reflect any inflation that may have occurred subsequent to incurring the debt, it is real interest rates that are most important to determining aggregate demand.[11] As Figure 5 shows, while nominal interest rates

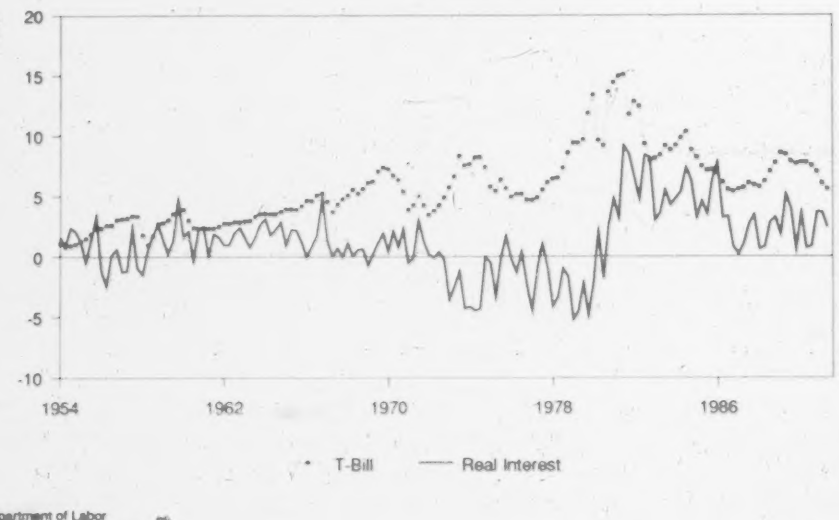
[11] Figure 5 reports quarterly levels of the nominal interest rate on Treasury bills. The real interest rate in Figure 5 is computed by subtracting the inflation rate, as computed by changes in the Consumer Price Index as in Figure 4, from the nominal T-bill rate.

Continued

since 1973 have generally exceeded those prevailing in earlier years, the course of real interest rates has been substantially different. Prior to 1973, real interest rates during recessions generally were positive, but low. From 1973 to 1980, real interest rates generally were negative both during times of recession and not. The recession of the early 1980s witnessed some of the highest real interest rates experienced in the post-World War II era. In contrast to the nation's three most recent recessions, real interest rates during 1991 have been more comparable to those prevalent prior to 1973.

Figure 5

Real and Nominal Interest Rates
1954-1991



Consumer sentiment

Another factor influencing consumer spending and business investment is expectations about the future: for consumers, expectations about their future financial well being, and for businesses, expectations about future demand for their products. For example, if consumers expect declines in their future economic well being, they often will reduce their expenditures today.

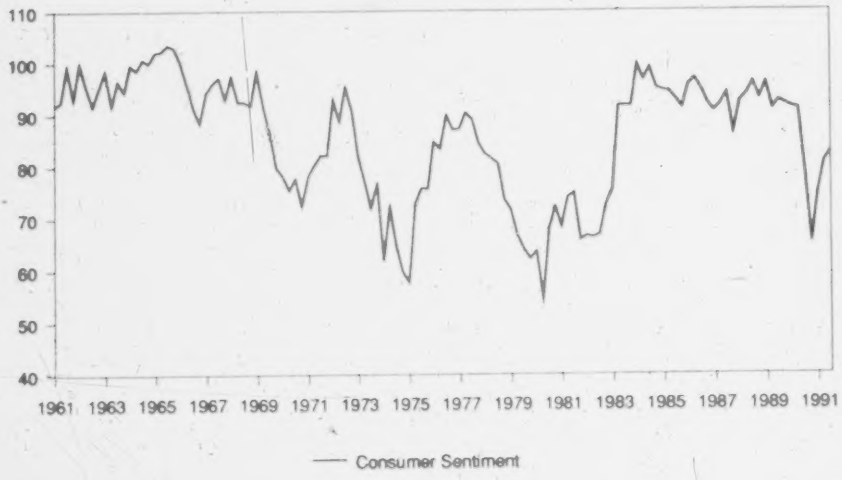
By this calculation, Figure 5 actually measures what economists call the *ex post* real interest rate, that is, the real interest that an investor actually would have earned after accounting for inflation. Economists stress that investment decisions and consumer decisions actually depend upon an *ex ante* real interest rate. An *ex ante* real interest rate is the real interest rate investors and consumers think prevails, accounting for their expectation of future inflation. To the extent that consumer and investor expectations of inflation differ from actual inflation experience, the *ex ante* and *ex post* inflation rates are different.

Supporting data for Figure 5 are in the Appendix.

Figure 6 displays the quarterly average of the University of Michigan's Index of Consumer Sentiment for 1961 through the third quarter of 1991.[12] In 1991, the index dropped to levels comparable to those recorded during 1982. The decline in consumer sentiment did not reach the levels experienced in 1975 or 1980. However, the initial decline appears to have been more precipitous than that experienced in 1974. The index rebounded in the second and third quarters of 1991, as indicated in Figure 6. However, the index has recorded declines in both October and November of 1991, with the November level equal to 69.1.

Figure 6

Index of Consumer Sentiment
1961-1991



University of Michigan,
Survey Research Center

Federal deficit

A well-known Keynesian prescription for addressing an economy in recession is to increase aggregate demand with stimulative fiscal policies. While many economists now doubt the efficacy of such policy,[13] the current size of the Federal deficit relative to GNP may limit such a policy in any event. Many observers view the Federal deficit as an indicator of the magnitude of Federal stimulus to aggregate demand. However, the actual size of the Federal deficit provides an inaccurate measure of government stimulus of aggre-

[12] The Survey Research Center at the University of Michigan makes periodic surveys of consumer attitudes and expectations. The overall index of consumer sentiment is composed of five individual indices: current personal finances; expected personal finances; expected business conditions over the next 12 months; expected business conditions over the next five years; and current buying conditions for durable goods. Supporting data for Figure 6 are in the Appendix.

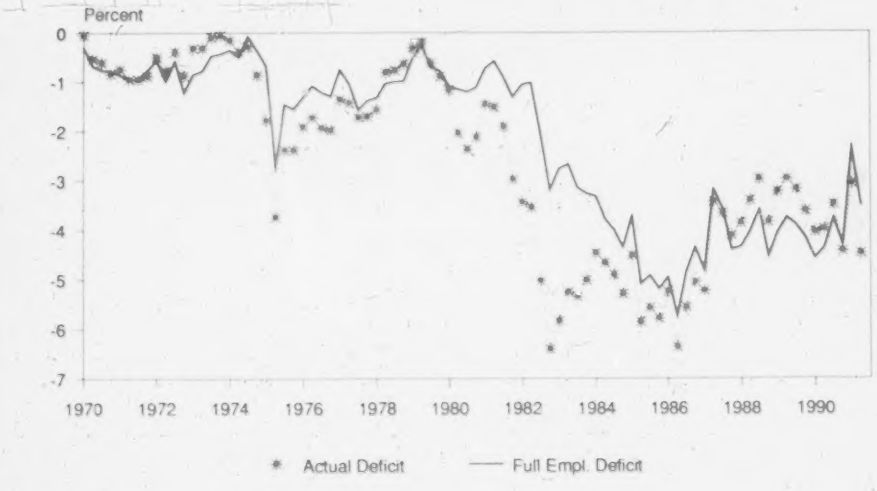
[13] See Part IV below for a discussion of this point.

gate demand. Even with no change in government policy the size of the deficit will change in a recession as the economic downturn reduces tax revenues and increases spending.

The full-employment deficit is an estimate of what the Federal deficit would be if the economy were at full employment.[14] For example, a deficit of $100 billion when the economy is experiencing 8-percent unemployment might be only $25 billion if the economy were at full employment. The concept of the full-employment deficit is meant to measure the net fiscal stimulus the government is adding to the economy. Figure 7 reports the Federal deficit and the full-employment deficit, as a percentage of real GNP. As Figure 7 indicates, the current net fiscal stimulus provided by the Federal deficit is somewhat larger than that provided in 1975 and comparable to that provided in 1982.[15]

Figure 7

Actual Deficit & Full Employment Deficit as a Percentage of Real GNP, 1970-1991



Department of Commerce,
Bureau of Economic Analysis

[14] By full employment, economists do not mean an unemployment rate of zero, but rather some larger number to reflect the normal quitting and search process of labor markets. There is debate about the "correct" measure of full employment for the United States economy. The full employment deficit reported here and below are based on calculations of a cyclically adjusted deficit by the United States Department of Commerce. Supporting data are in the Appendix.

[15] Some economists have commented that neither the actual nor the full-employment deficit is an accurate measure of Federal fiscal policy stimulus. They argue that such measures of the deficit include timing of outlays the liability for which may have occurred earlier and that the timing of the outlay has no real effect on the economy. An example in our current economic context would be the expansion in the actual deficit incurred to cover insured deposits in the thrift and banking industries. Such liabilities were incurred prior to the current outlays. For this reason, this increase in the deficit does not represent fiscal stimulus.

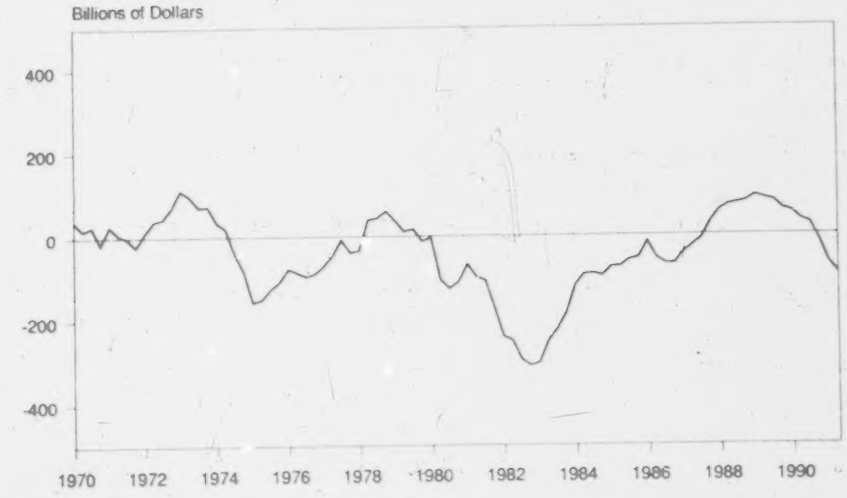
Full-employment GNP

One measure of the economic cost of a recession is the amount of output lost to the economy. Gross National Product (GNP) represents two measures of well-being. First, GNP represents the total output of the economy. Hence, it measures the goods and services available for consumption. Second, GNP represents the total income earned by persons. Hence, it measures the nation's ability to purchase goods and services. The difference between actual and full-employment GNP can be thought of as representing lost consumption or lost income.

Figure 8 measures the difference between actual GNP and full-employment GNP since 1970 measured in constant 1982 dollars. Full-employment GNP is an estimate of the level of GNP the economy would have attained had the economy been at full employment. Hence, the area of deviation of actual GNP below the horizontal line at zero represents the GNP lost to the economy because it operated at a level other than full employment. The figure indicates that by this measure the most recent recession has not been nearly as costly as the 1982 or 1974 recessions.[16]

Figure 8

Deviation From Full Employment
Real GNP, 1970-1991



Department of Commerce,
Bureau of Economic Analysis

[16] The constant dollar value of full-employment GNP increases through time. Consequently, the percentage deviation from full-employment GNP for the 1974 recession is more comparable to that of 1982 than Figure 8 might indicate.

C. Long-Run Economic Performance [17]

Overview

The most basic measure of the level of national welfare is per capita GNP or per capita gross domestic product (GDP).[18] By these measures, the United States is an economically successful country. Table 2 provides a comparison of 1988 per capita GDP of the United States with that of several other countries. The table uses two different measures. The first measure converts the per capita GDP for each country to United States dollars by using the average 1988 dollar exchange rate of that country's currency. Because exchange rates do not always reflect the relative price levels of different countries, particularly in the 1980s when exchange rates were unusually volatile, some argue that intercountry comparisons of output should measure the purchasing power of different countries' currencies (known as "purchasing power parity"). The second measure in Table 2 provides the 1988 per capita purchasing power of the various countries.

Using the exchange rate method, the United States has the fourth highest per capita GDP of the countries listed. Under the purchasing power parity method, the United States has the highest per capita GDP.

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[17] For more information on the long-run economic performance of the United States, see, Joint Committee on Taxation, *Factors Affecting the International Competitiveness of the United States*, (JCS–6–91), May 30, 1991.

[18] Gross Domestic Product (GDP) of a country is the value of all marketed goods and services produced in that country. Gross National Product (GNP) is GDP plus the net factor income received by residents of that country from abroad. Thus, wages earned by a United States resident from temporary work abroad constitute part of GNP, but not GDP. Similarly, the returns from investment abroad constitute part of GNP, but not GDP.

Table 2.—1988 Per Capita Gross Domestic Product (GDP) of Selected Countries

[In 1988 dollars]

Country	Per capita GDP	
	Computed using OECD 1988 exchange rate [1]	Penn World Table V purchasing power parity [2]
United States	$19,715	$19,851
Japan	23,226	13,645
Germany	19,560	14,621
France	17,107	13,584
United Kingdom	14,616	13,060
Italy	14,653	13,001
Canada	18,969	17,681
Belgium	15,275	13,005
Greece	5,290	6,436
Netherlands	15,401	12,684
Sweden	21,545	14,941
Switzerland	27,498	17,763
Australia	15,935	14,529

[1] Exchange rate based on average daily rate for the year 1988.

[2] National currency expenditures are converted to an international, dollar-denominated currency to make real quantity comparisons across countries. The international, dollar-denominated currency is a weighted average of the relative prices for the same goods in all countries. Source: Robert Summers and Alan Heston, "The Penn World Table (Mark V): An Expanded Set of International Comparisons, 1950-1988," *Quarterly Journal of Economics*, Vol. 106, May 1991.

Source: OECD, *National Accounting, 1960-89*, Volume 1, 1989, and OECD, *Labor Force Statistics, 1968-1988*, 1990.

A long-run policy goal is that the United States maintain a high and growing standard of living for its residents. Trends in the growth of wages and GDP suggest that this may be difficult to achieve in the future. Many other countries have experienced

higher rates of income growth than has the United States. Low rates of investment and even lower rates of saving may explain some of the decline in the relative position of the United States economy.

The role of investment.—When an economy's rate of net investment (gross investment less depreciation) increases, the economy's stock of capital increases. A larger capital stock permits a fixed amount of labor to produce more goods and services. The larger a country's capital stock, the more productive its workers and, generally, the higher its real wages and salaries. Thus, increases in investment tend to cause future increases in a nation's standard of living.

In the short run, increases in gross investment (investment in new capital as well as investment that is undertaken to replace depreciated or worn out capital) will increase the capital stock. As the capital stock increases, worker productivity increases and the economy will experience a higher rate of growth. Because a larger capital stock results in a larger amount of depreciation, in the long run any given rate of investment will just offset the depreciation of the steady-state capital stock. Thus, in the long run, an increase in the level of investment increases a nation's standard of living, but may not increase a country's long-run rate of growth. To sustain a higher growth rate, investment must continue to increase as a percentage of GNP.[19]

The role of saving.—Investment involves a trade-off between consumption today and consumption tomorrow. Investment either can be financed by national saving or by foreign borrowing (saving by foreigners). A basic accounting identity of the national income and product accounts states that national investment must equal the sum of private saving, government saving, and net foreign borrowing.[20]

If capital does not flow freely between nations, then the level of national saving can affect the level of investment. When the domestic saving rate is low, so is the domestic investment rate. Historically, there has been a strong positive correlation between a country's rate of investment and its rate of saving.[21] Although this relationship has become weaker over time,[22] it is still true that countries with high saving rates also generally have high investment rates.

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[19] A qualification exists to this analysis. If the new capital embodies new technology, it is possible that a higher investment level can lead to a higher growth rate even in the long run. Even if there is no growth in the level of investment, the investment to replace depreciated capital may still enhance economic growth because the new capital is more productive than the capital it replaced. The higher the level of investment, the more new capital is purchased each year, and, thus, the higher the rate at which new technologies may get adopted.

[20] For a complete discussion of national income identities and measured saving, see, Joint Committee on Taxation, *Factors Affecting the International Competitiveness of the United States*.

[21] See, for instance, Martin Feldstein and Charles Horioka, "Domestic Saving and International Capital Flows," *Economic Journal*, vol. 90 (June 1980), pp. 314–329.

[22] See Phillippe Bacchetta and Martin Feldstein, "National Saving and International Investment," National Bureau of Economic Research Working Paper #3164, November 1989.

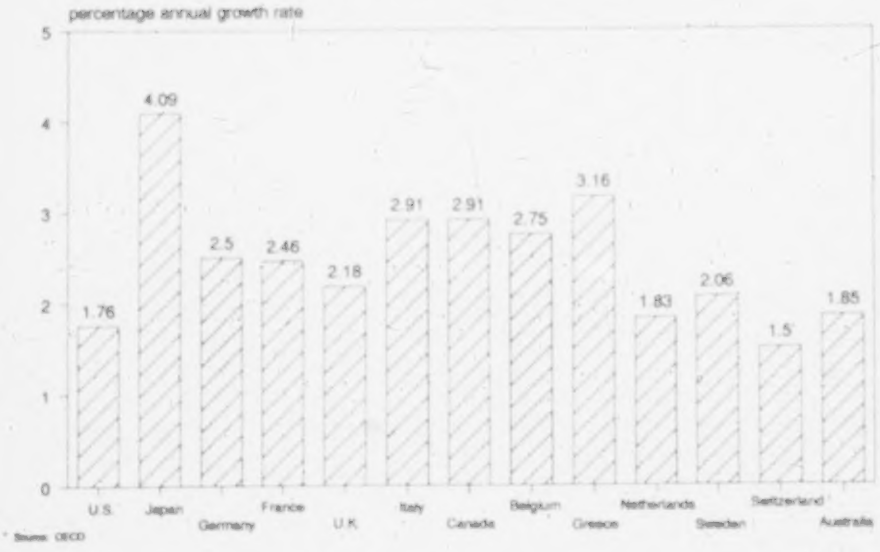
Trends in per capita GDP and real wages

Per capita GDP shows a country's standard of living for a single year. Growth rates of per capita GDP show the rate at which a country's standard of living has changed over time. To place the United States in an international context, data are presented below on the growth rate of real per capita GDP [23] and the growth rate of real wages.

The growth rate of real per capita GDP may be the most direct measure of the rate of improvement in a country's standard of living. Figure 9 below compares the average annual growth rates of real per capita GDP for selected countries for the period 1969 to 1988. As Figure 9 displays, the United States ranks near the bottom of the countries shown.[24] United States real per capita GDP growth averaged less than 1.8 percent per year from 1969 to 1988 compared to 2.2 percent for the United Kingdom, 2.9 percent for Canada, and 4.1 percent for Japan.

Figure 9

Average Annual Growth Rates of Per Capita GDP, 1969-1988



[23] Real per capita GDP is calculated by deflating each country's nominal per capita GDP denominated in its own currency by each country's inflation rate.

[24] See Appendix Table 7 for data by subperiod. Partly because the United States recovered from the recession in the early 1980s more robustly than did other countries, the rate of per capita GDP growth in the United States in the second ten years, while slightly below the rate for the first ten years, is close to the median of this group of countries in the second ten years. Growth rates for some of the countries also may reflect rebuilding from the destruction of World War II.

Table 3 below reports annual real wage growth in manufacturing over the period 1960 to 1989 for selected countries. Over the long run, rising real wages are associated with increases in worker productivity, whereas stagnant real wages are associated with stagnating productivity growth.

Table 3.—Annual Growth Rates of Real Hourly Compensation in Manufacturing in Selected Countries,[1] Decadal Averages, 1960s–1980s

Country	1960s	1970s	1980s	Average 1960–1989
United States	2.1	1.3	0.0	1.1
Japan	7.8	5.4	2.0	4.9
Germany	6.4	5.9	2.1	4.7
France	5.2	5.5	2.0	4.2
United Kingdom	2.9	4.4	2.0	3.1
Italy	6.4	6.7	1.3	4.7
Canada	2.7	2.8	0.6	2.0
Belgium	6.2	6.8	1.0	4.6
Greece	NA	NA	NA	NA
Netherlands	7.4	5.7	1.0	4.6
Sweden	5.8	4.3	0.6	3.5
Switzerland	NA	NA	NA	NA
Australia	NA	NA	NA	NA

[1] Compensation is in own-country currency, deflated by own-country consumer prices.

NA—not available.

Source: U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, "Output per Hour, Hourly Compensation, and Unit Labor Costs in Manufacturing, Fourteen Countries or Areas, 1960–1989," April 1991.

As with GDP growth, the United States' wage growth in manufacturing is well below that of most other countries, showing stagnant manufacturing wage growth in the 1980s, and very low growth in the 1970s. While the growth in real wages generally mirrors the growth of labor productivity, real wage growth can differ from productivity growth if the share of non-wage compensation increases (e.g., if employer-provided health benefits increase), or in the short run, if there is a shift in the distribution of income between labor and capital.

Trends in investment

Table 4 below reports gross and net private investment of the United States as a percentage of GNP for selected years, (1929-1990). Table 4 indicates that as a percentage of GNP, both the rate of gross and net investment generally were lower in the 1980s than in the 1970s.

Table 4.—Gross and Net Private Investment of the United States as a Percentage of GNP, Selected Years, 1929–1990

Year	Gross private domestic investment a percentage of GNP	Net private domestic investment as percent of GNP
1929	16.1	6.5
1939	10.4	0.5
1949	14.0	5.6
1954	14.5	5.8
1959	16.2	7.2
1964	15.3	7.0
1969	15.9	7.4
1970	14.6	5.9
1971	15.6	6.8
1972	16.7	7.8
1973	17.6	8.9
1974	16.3	7.0
1975	13.7	3.6
1976	15.6	5.5
1977	17.3	7.2
1978	18.5	8.3
1979	18.1	7.5
1980	16.0	4.9
1981	16.9	5.5
1982	14.1	2.0
1983	14.7	3.1
1984	17.6	6.6
1985	16.0	5.1
1986	15.6	4.7
1987	15.5	4.7
1988	15.3	4.8
1989	14.8	4.2
1990 [1]	13.6	3.1

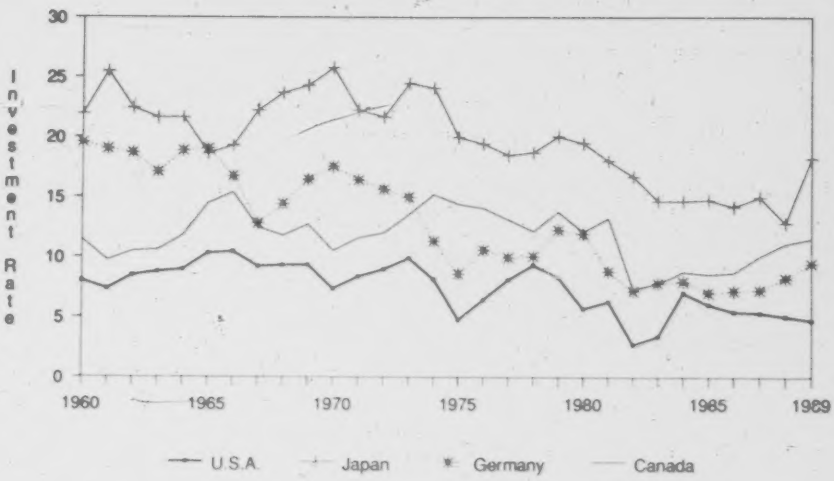
[1] Estimate.

Source: Department of Commerce, Bureau of Economic Analysis.

The U.S. investment rate has long been lower than that of other developed countries. For instance, over the past 30 years, the Japanese investment rate has averaged over two and one-half times that of the United States, while that of Germany has been more than two-thirds greater. While the gap has narrowed in the past decade, the rate of investment in the United States remains significantly below that of other countries. Other countries also have experienced declining net investment rates in the 1980s. Figure 10 indicates that net investment as a percentage of GDP has been lower in the 1980s than in the 1970s or late 1960s for each of the United States, Canada, Japan, and Germany.

Figure 10

Net National Investment Rates as a Percentage of GDP, 1960-1989



Source: OECD

Trends in national saving

National saving is divided into private saving and public saving. Private saving comprises household or personal saving and business saving. Households save by not spending all of their disposable (i.e., after-tax) income. Businesses save by retaining some of their earnings. Public saving reflects the extent to which the Federal, State, and local governments run budget surpluses.

Table 5 presents United States net saving by component as a percentage of gross national product. As Table 5 demonstrates, net business saving,[25] net personal saving, and public saving were all lower during the 1980s than in any of the three previous decades. Though private saving remained positive, it fell during the 1980s. Moreover, public saving was consistently negative during the 1980s as the result of Federal deficits. The magnitude of public dissaving generally was larger relative to GNP in the 1980s than in earlier years. As the table indicates, net national saving is lower after 1981 than at any time in the post-World War II era.

[25] Table 5 presents net saving, which equals gross saving less capital consumption (depreciation).

Table 5.—Components of United States Net National Savings as a Percentage of GNP, Selected Years, 1929–1990

Year	Net personal saving	Net business saving	Total net private saving	Public saving	Total net national saving
1929	2.5	2.3	4.8	1.0	5.8
1939	2.0	0.3	2.3	−2.4	−0.1
1949	2.8	4.0	6.9	−1.3	5.6
1954	4.4	2.6	7.0	−1.9	5.1
1959	4.4	3.2	7.6	−0.3	7.2
1964	4.8	3.9	8.8	−0.4	8.4
1969	4.4	2.6	7.0	1.0	8.0
1974	6.6	1.4	7.9	−0.3	7.6
1975	6.5	2.3	8.9	−4.1	4.8
1976	5.4	2.6	8.0	−2.2	5.8
1977	4.6	3.1	7.7	−1.0	6.7
1978	4.9	3.1	8.0	0.0	7.9
1979	4.7	2.5	7.2	0.5	7.6
1980	5.0	1.4	6.4	−1.3	5.1
1981	5.2	1.4	6.6	−1.0	5.7
1982	4.9	0.6	5.5	−3.5	2.0
1983	3.8	1.9	5.7	−3.8	2.0
1984	4.4	2.5	6.8	−2.8	4.1
1985	3.1	2.6	5.7	−3.3	2.4
1986	3.0	2.0	4.9	−3.4	1.5
1987	2.0	1.8	3.9	−2.4	1.5
1988	3.0	1.9	4.9	−2.0	2.9
1989	3.3	1.0	4.3	−1.7	2.6
1990	3.3	0.5	3.8	−2.3	1.5
Average 1950–59	4.7	2.8	7.5	−0.1	7.4
Average 1960–69	4.6	3.5	8.1	−0.3	7.9
Average 1970–79	5.6	2.4	8.0	−1.0	7.1
Average 1980–89	3.8	1.7	5.5	−2.5	3.0

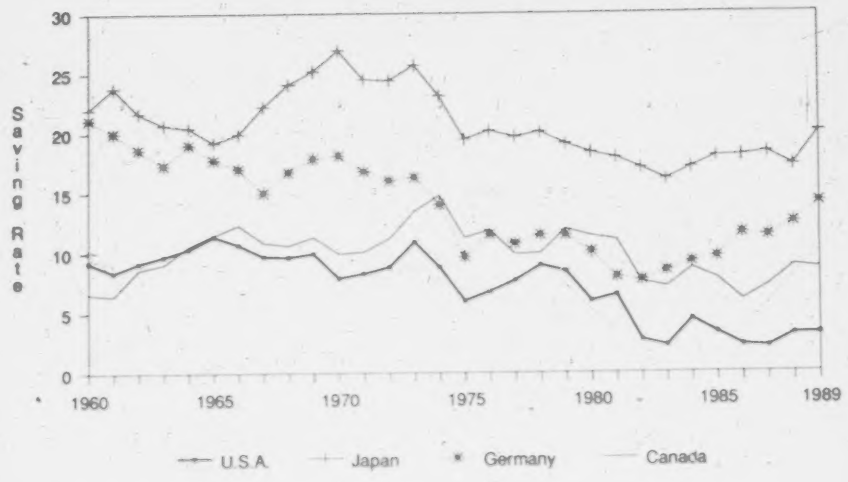
Source: Department of Commerce, Bureau of Economic Analysis.

The United States national saving rate is low when compared to that of other developed nations. Figure 11 also highlights the saving rate of the United States, Canada, Germany, and Japan from 1960-1989. More generally, the net saving rate of the United States during the 1980s was below the saving rates of most countries in the OECD.[26] One common trend is that saving rates of all nations have declined from the rates of the late 1960s.

[26] See Joint Committee on Taxation, *Factors Affecting the International Competitiveness of the United States*, for more data and discussion on this point.

Figure 11

Net National Saving Rates as a Percentage of GDP, 1960-1989



Source: OECD

D. The Distributive Performance of the U.S. Economy

Figure 12 portrays the trends in pre-tax median U.S. family income, measured in constant 1990 dollars, over the past 30 years. From this chart, it is apparent that the relatively lengthy post-World War II period of real income growth ended around 1973, with the level in 1990 being approximately the same as it was in 1973. The figure also shows that the decline in median family income associated with the recession in 1979 was offset by the growth in the mid-1980s. One implication of Figure 12 is that choice of starting point is quite important in measuring income growth over the past 20 years or so. For example, 1981-1990 is a period of marked growth in median family income.

Figure 12

Median U.S. Family Income, 1990 Dollars, 1960-1990

Department of Commerce, Bureau of the Census

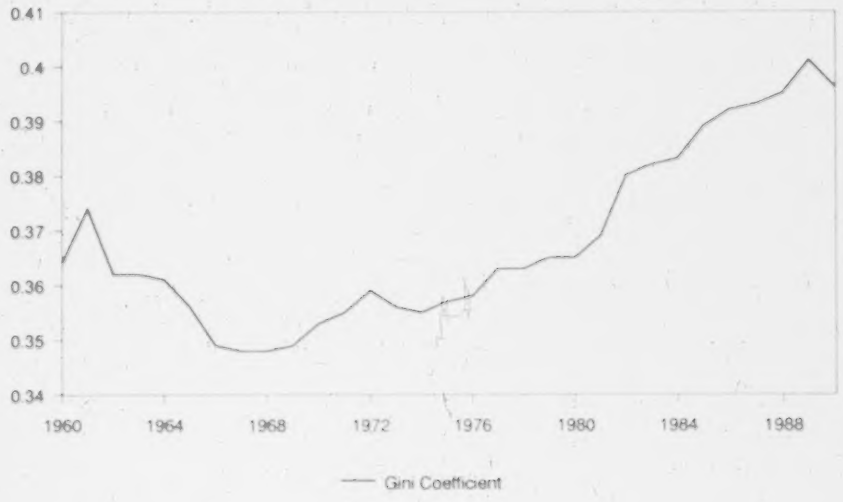
Figure 13 portrays the change in Gini coefficients over the same 1960-1990 period. The Gini coefficient is a standard measure of income inequality used by economists to summarize the characteristics of an income distribution in a single number. This measure equals 1.0 when all income in an economy is attributable to a single economic unit, and 0.0 when all income is equally distributed among the economic units in the economy. Therefore, smaller values of the Gini coefficient are associated with a more equal distribution of income. The mid to late 1960s was characterized by a reduction in income inequality as measured by the Gini coefficient. This means that over this period, incomes became more equalized. From its trough in 1968, the Gini coefficient has increased. Beginning in 1980, income inequality appears to have increased at a

more rapid rate. The underlying data indicate that incomes among the lowest-income households grew at a rate much less rapid than those of the highest-income households in the early 1980s. Subsequent to this, the growth rates in incomes more or less equalized between high- and low-income households. However, lower-income households have yet to make up the relatively low growth rate in their real income in the early 1980s. One should note that there is no consensus regarding what may constitute an optimal distribution of income. In addition, Figure 13 measures changes in the Gini coefficient over a relatively small range.

Median income reported by the Census Bureau measures only cash income. Consequently, non-wage compensation (e.g., employer-provided health insurance) is not included. If the share of non-wage compensation changes over time, Figures 12 and 13 may not completely reflect trends in income. In addition, examination of annual data will tend to measure a larger degree of inequality compared to a similar measure based on lifetime income.

Figure 13

A Measure of U.S. Income Inequality, 1960-1990



Bureau of the Census

III. WHAT FISCAL POLICY CAN DO: SUPPLY VS. DEMAND INCENTIVES

Aggregate demand and aggregate supply

Part II presented data on the aggregate output of the economy (GNP) and showed the gap between its current level and its potential.[27] The theoretical construct for understanding how the level of GNP and the aggregate price level are determined is the interaction of aggregate demand and aggregate supply.

Aggregate demand measures the total amount of goods and services households, firms, and governments are willing to buy at given aggregate price levels. It is the sum of consumers' expenditures for goods and services, firms' expenditures on domestic investment goods, government purchases of goods and services, and exports net of imports.

Aggregate supply measures the total amount of goods and services households, firms, and governments are willing to produce at given aggregate price levels. In the long run, the aggregate supply is equal to potential GNP—the amount of goods and services that could be produced in a given year with full employment of the economy's resources. Aggregate supply is thus determined by the amount of resources available to the economy—natural resources, labor, capital—and the technological know-how to use those resources. In the short run, aggregate supply need not coincide with potential GNP (which is equal to the productive capacity of the economy). Resources may be underused or the economy may be producing beyond normal capacity.

In the long run, increases in potential GNP (aggregate supply) per capita determine the growth rate of per capita consumption possibilities. The higher the growth rate of potential GNP per capita, the more goods and services there are to meet the needs and desires of the households in the economy and the higher the standard of living for those households. Encouraging long-run growth in aggregate supply will thus improve future households' well-being.

As the long-run aggregate supply changes over time, the distribution of income may also change. Part VI, following, examines the distribution of income in the economy and the trends in that distribution over recent decades. Policymakers concerned about the distribution of output across households must recognize that redistributive policies are not costless. Tax and transfer policies to change the distribution of goods and services may result in a slower long-run growth of aggregate supply and hence a smaller amount of goods and services available to the economy. The ques-

[27] See Figure 9 and the accompanying text for a discussion of the measurement of potential (full-employment) output.

tion of how much one is willing to trade off slower growth for a more even distribution of goods and services is a contentious one. Economics cannot offer a judgment as to the "right" answer to this tradeoff.[28]

Macroeconomic policies [29]

Policies targeted to increasing aggregate supply are designed to increase potential GNP and thus the long-run productive capacity of the economy. For example, investment incentives can lead to an increase in the economy's aggregate amount of capital. With more capital, natural resources and labor can be more productive, so the economy's capacity to produce goods and services increases. Improved education and training for the workforce can increase the quality of a given amount of labor and thus increase capacity. Technological advances can allow increased output from a given stock of resources.

Policies targeted to increasing aggregate demand are designed to move the economy closer to full employment of current capacity. When labor, capital, and natural resources lie idle, an increase in aggregate demand will result in unplanned inventory reductions for producers. In the process of replenishing those inventories, previously idle or underused resources will be called into action. The government can increase aggregate demand directly through increases in its purchases of goods and services, such as through additional public works programs or weapons procurement. The government can also act indirectly through tax cuts or increased transfer payments to individuals in order to increase consumers' disposable incomes. If those increased disposable incomes translate into increased consumption expenditures, then aggregate demand will increase. Government incentives for business fixed investment can lead to increased aggregate demand through increased orders for capital goods.

Targeting possible policies to perceived problems

Parts IV and V, following, will detail the types of aggregate demand and aggregate supply policies that could be employed to address current economic problems. But before a choice of policies is made, one needs to be clear about the economic problems to be addressed. In general, aggregate supply incentives address the long-run growth of capacity (potential GNP), while aggregate demand incentives address the immediate, short-run problem of underutilization of existing capacity.

The policymaker's decision is complicated in that some policies may be intended to affect aggregate supply but will also have an effect on aggregate demand and vice versa. It may be difficult to

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[28] Arthur M. Okun used the analogy of a "leaky bucket" to describe the problem facing those who want to redistribute goods and services. Redistribution would proceed as if by transfers using a leaky bucket. In the process of redistribution, potential output is lost. Arthur M. Okun, *Equality and Efficiency*, Brookings Institution, 1975.

[29] This discussion in this pamphlet is limited to the consideration of government fiscal policies that can affect either aggregate demand or aggregate supply. It should be noted that monetary policy, largely the responsibility of the Federal Reserve Board, can also be employed to affect aggregate demand. In the short run, monetary policy may be able to increase aggregate demand by reducing interest rates to stimulate business investment and individuals' durable goods consumption.

target just one of the two. Moreover, a policy could have a desirable short-run outcome and an undesirable long-run outcome. For example, stimulating consumption through an individual income tax cut could help achieve better utilization of the economy's current capacity, but may inhibit the long-run growth of capacity because the increased consumption comes at the expense of private savings.

Part II, above, provided data showing that productivity growth, saving rates, and investment in the United States over the last 20 years have all been low relative to both historical and international standards. If long-run decline in the economy's standard of living is seen as the major problem, then policy ought to be directed toward increasing aggregate supply. Higher aggregate supply will increase the per capita consumption possibilities of the economy in the long run. One might oppose policies that would address the recent recession *if in the process* those policies also would hinder the long-run growth of aggregate supply. Instead, one may want to allow recovery to take its course while concentrating policy on attempts to improve the long-run outlook for the economy.

Data in Part II also showed that economic conditions in the short-run are troubling. If the recent recession is seen as the major problem rather than sluggish long-run growth of the economy, then policies targeted to increasing aggregate demand may be appropriate. This is the standard Keynesian prescription of fighting economic contractions by stimulating aggregate demand,[30] usually with the government directly increasing its purchases of goods and services or indirectly increasing the private sector's purchases of consumption and/or investment goods through tax cuts or targeted incentives. When resources in the economy are fully utilized, then the government stimulus is removed, lest inflation be kindled.

One needs to be clear about the ills to be attacked because a package of actions cobbled together could end up with individual elements working at cross purposes to one another. For example, policies to increase consumption might be appropriate to boost aggregate demand and push the economy toward full employment. Such policies would be inappropriate if inadequate long-run growth in aggregate supply were seen to be the problem. In fact, they would be counterproductive, since increased consumption would come at the expense of national saving. Conversely, policies to increase savings would be appropriate to increase aggregate supply. An increased pool of savings might reduce equilibrium interest rates and allow a larger amount of investment projects to be financed, thus increasing the size of the capital stock in the long run. But increasing savings could be counterproductive if the recent recession were seen as the main problem. Individuals would be able to increase private savings only by reducing consumption, thus decreasing aggregate demand in the short run. If one believes that both problems of long-run sluggish growth in potential GNP and short-run underutilization of capacity exist, then one also must recognize that policies intended to combat one of the problems may exacerbate the other.

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[30] "Keynesian" policies are generally those associated with influencing aggregate demand through fiscal policy. See Part IV, following, for a more thorough discussion.

Some policies may be able to address both underutilization of current resources and sluggish growth in potential GNP. Increased investment would increase both aggregate demand and aggregate supply. For example, increased spending on either private or public capital goods would increase aggregate demand directly,[31] and would increase aggregate supply through the addition to the capital stock.

The design of the investment incentives is important, however. In order to accomplish both goals, the incentives must work on the margin, that is, inducing investment that would not otherwise have taken place. Current use of capacity would increase as production geared up to meet the increased demand for investment goods. Future productive capacity would be increased as the new investment took place and the capital stock was increased beyond what would have occurred in the absence of the incentives. If instead the investment incentives induced no new investment but simply paid benefits to investment that would have occurred anyway, then only aggregate demand would increase. Economists would call such an investment incentive "inframarginal" because it does not change the effective cost of acquiring an additional (i.e., marginal) unit of capital. The benefit such an incentive provides will increase current demand by increasing the income of the firms and individuals who receive it. But if national savings is reduced, as would happen if this inframarginal investment incentive is financed by increased budget deficits, then the long-run growth of potential GNP will be slowed even more.

[31] As noted above, firms' expenditures on domestic investment and government spending on goods and services are both components of aggregate demand.

IV. MANAGEMENT OF SHORT-RUN FLUCTUATIONS IN AGGREGATE DEMAND THROUGH FISCAL POLICY

A. Overview

The term "fiscal policy" is usually associated with changes in the government's *budget deficit*. Fiscal policy intended to stabilize the *short-term* fluctuations in the nation's total *demand* for goods and services is generally referred to as "Keynesian policy." [32] Keynesian fiscal policy may take the form of a change in government spending or a change in the amount of tax or of a combination of expenditure and tax changes. Keynesian policy may be "automatic" as in the case of programs already in place that increase transfer payments and reduce taxes during a recession. Alternatively, fiscal policies may be "discretionary" as in the case of statutory increases in public works or reductions in tax that are intended to stimulate the economy in a recession. Examples of discretionary tax policies that might stimulate demand include reductions in individual income tax rates, increases in earned income tax credits, increases in personal exemptions, cuts in social security taxes, cuts in excise taxes, increased business tax credits, and more accelerated methods of depreciation.

In the 1960s and 1970s, it was commonly assumed that government policies could reduce unacceptably high unemployment with little impact on inflation,[33] and that it might be possible to "fine tune" the economy.[34] This view of the possibilities of macroeconomic policy came into question in part because it is not supported by developments in macroeconomic theory and in part because the track record of discretionary fiscal policy reveals that in many cases policies intended to dampen business cycles actually contributed to destabilizing the economy.[35] In contrast to its central role during the 1960s and 1970s, Keynesian economics played a relatively minor role in economic decisionmaking in the 1980s.

B. The Standard Keynesian Macroeconomic Framework

Distinction between recessions caused by changes in aggregate demand and aggregate supply

The experience of the 1970s has made clear to economists that recessions may be caused by both movements in aggregate supply as well as aggregate demand. The oil price shocks of 1973 and 1979 represented large and sudden reductions in aggregate supply. The

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[32] In reference to economist John Maynard Keynes, author of *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936).

[33] See, for example, *1962 Economic Report of the President*, pp. 37-38.

[34] See, James Tobin, *The New Economics One Decade Older* (Princeton: Princeton University Press, 1974), pp. 36-37.

[35] N. Gregory Mankiw, "A Quick Refresher Course in Macroeconomics" *Journal of Economic Literature*, Vol. XXVII (December 1990), pp. 1645-1660.

distinction between a recession caused by a change in aggregate demand and one caused by a change in aggregate supply is important because different and often opposite macroeconomic policies are appropriate depending upon a recession's nature and causes.

The role of demand in business cycles

In the private sector, three major components of aggregate demand are consumption expenditures by domestic households, capital expenditures by domestic businesses, and net exports to foreigners. Government expenditure on goods and services is a fourth major component of aggregate demand.

If the cause of a recession is a decline in aggregate demand, the standard policy prescription is government action to increase aggregate demand. For example, consider the case where the economy had aggregate demand that initially was sufficient to fully utilize all its productive capacity. Suppose, however, that business expectations about future profitability declined so businesses reduced investment spending. In this case, there is a decline in aggregate demand that could result in a recession. The remedy typically prescribed would be an attempt to increase aggregate demand through an increase in government spending or a reduction in taxes.

Fiscal policy and aggregate demand

The government can increase aggregate demand directly by increasing government expenditures on goods and services. Alternatively, aggregate demand of the private sector may be stimulated by tax cuts. Individual tax cuts may increase consumption expenditures, and business tax cuts may increase capital expenditures. Budget policy is only one of two methods of stimulating aggregate demand. The government, through various actions of the Federal Reserve Board, may also attempt to increase aggregate demand through increases in the money supply or reductions in interest rates.

Keynesian policies are appropriate only when an economy is not utilizing its full capacity. If the economy is near full capacity, fiscal stimulus is less likely to be effective in increasing real national income because demand already may be adequate to utilize fully existing capacity. In this case, fiscal stimulus would not increase income because national income generally cannot exceed the value of the economy's output when it is operating at full capacity. Furthermore, increases in aggregate demand when the economy is already fully employing its resources would result in inflation.

Multiplier effects

A central consideration in the implementation of any fiscal stimulus is the degree that national income increases as the result of increases in government spending or reductions in taxes. It might be the case that, for example, a $1 billion increase in government expenditures increases national income by more than $1 billion. This occurs because the $1 billion of government expenditures (if spent on domestic goods and services) may result in $1 billion of income to the domestic producers of the goods and services purchased by the government but the $1 billion of earnings, in turn, may be spent on domestic goods and services. However, this second

round of expenditures will most likely be less than $1 billion, say $800 million, since some of that income will be saved or spent on imported goods. The second round of $800 million in expenditures can raise income by $800 million which induces another, but smaller, round of expenditure. Thus, an initial government expenditure induces many rounds of expenditure, but each successively smaller. If all individuals in the economy devote 80 cents of each additional dollar of income to domestic expenditures, a $1 billion increase in government expenditures could increase national income by $5 billion. This is known as the "multiplier effect" of fiscal policy.

Although these potential increases in national income are multiples of an increase in the budget deficit, there are many reasons to expect that multiplier effects are relatively small. First of all, Keynesian policy is only effective to the extent the economy is operating below full capacity, and many economists now believe that the economy will not operate below full capacity for extended periods. Furthermore, as will be discussed more fully below, even if current demand were substantially below aggregate supply, tax cuts may not have as large an effect of demand as portrayed in these simple models because higher interest rates and higher prices could crowd out any fiscal stimulus.

Potential effects of revenue-neutral changes

Fiscal policies that are intended to affect aggregate demand usually involve changes in the government budget deficit. However, given the differences in various policy multipliers, there is potential for policy combinations with both expansionary and contractionary elements to provide on net some fiscal effects without any overall change in the size of the government budget deficit. The fiscal effects of these balanced budget policies may be either positive or negative. In either case, their effects on output will tend to be substantially less than policies that affect the deficit.

Tax cuts financed by reduced spending.—The effect on aggregate demand of a change in government spending is considered generally to be greater than the fiscal effect of change in taxes of an equal dollar amount. Therefore, a tax cut that is financed with cuts in government spending could be mildly contractionary. This would occur because the household sector saves and purchases imports with some portion of their tax benefit (say, 10 cents of every dollar of tax reduction), and therefore its increase in spending does not entirely offset the reduction in government spending. Macroeconomists refer to the policies that combine tax changes and offsetting changes in spending as "balanced-budget" Keynesian policies. Even under the most favorable conditions, "balanced-budget multipliers" are believed generally to have values no greater than one, i.e., a $1 billion reduction in taxes matched by a $1 billion reduction in government expenditures could reduce national income by $1 billion at most and, conversely, a $1 billion increase in taxes matched with a $1 billion increase in government spending could increase national income by no more than $1 billion.[36] Thus, although fiscal policy

[36] See, Walter A. Salant, "Taxes, Income Determination, and the Balanced Budget Theorem," in Robert A. Gordon and Lawrence R. Klein, eds., *Readings in Business Cycles* (Homewood, Ill.: R.D. Irwin, 1965).

that does not increase the deficit may potentially have some effect on aggregate demand, this effect is relatively small and could be either expansionary or contractionary.

Fiscal effects of redistributive tax policies.—The fiscal effects of tax changes on low-income households are generally considered to be larger than those on high-income households because low-income households are generally considered to consume more of their current income than do high-income households. Therefore, it is sometimes asserted that tax cuts for low-income households financed by tax increases on the high-income households could be mildly expansionary in the short-run if such a change elicited net increases in spending. This line of reasoning is subject to many caveats (which are discussed below).

C. Limitations of the Standard Keynesian Framework

1. Theoretical shortcomings of the standard framework

a. Potential "crowding out" of the private sector in the credit markets

Adverse impact on interest rates

Effect on investment and consumer durables.—The simplified analysis described above ignores the impact of fiscal policy on financial markets. An increase in aggregate demand usually will increase the demand for money and credit and, therefore, potentially may increase interest rates and cause the rationing of credit. The most obvious manifestation of this "crowding out" effect is that spending or tax cuts that are financed with increased issuance of government bonds may increase the rate of interest in the government bond markets. This rise in the government bond rate in turn will raise rates for bonds issued by corporations and State and local governments as well as rates for consumer, mortgage, and business loans. Such a tightening of credit markets can reduce business investment and personal consumption expenditure. This especially may be true for interest-sensitive sectors such as housing and consumer durables, and for capital goods purchased by small businesses and other businesses that may have difficulty in obtaining credit.

Effect on trade.—Besides the contractionary effects of higher interest rates on consumer durables and investment goods, higher interest rates may also have a negative effect on net exports. Higher domestic interest rates attract foreign investment which drives up the value of the dollar. An appreciation of the dollar reduces the cost of imports to U.S. residents and raises the price of U.S. exports in foreign markets. If these price changes result in a net reduction in exports, there would be a contraction in the aggregate demand for U.S. goods and services.

Any reduction of expenditures due to higher interest rates will offset the initial fiscal-policy stimulus. Under certain conditions, if the fiscal stimulus sufficiently tightens credit conditions and expenditures are particularly sensitive to higher interest rates, then the fiscal stimulus could be completely eliminated. Although complete crowding out seems unlikely when the economy is in recession, the amount of any fiscal stimulus provided by the budget poli-

cies described above could be substantially reduced by the negative effects of higher interest rates.

Potential "accommodation" by the Federal Reserve

Because of these potentially adverse effects of fiscal policy on credit markets, it often is suggested that fiscal policy would be most effective if accompanied by expansionary monetary policy. Expansionary monetary policy could keep interest rates low and credit abundant despite increased demand for money and loanable funds. This type of accommodating monetary policy may alleviate any tightening of credit, especially in the short run. However, this pairing of monetary policy with fiscal policy is not necessarily desirable. Many economists believe that, whatever improvements in credit conditions are provided by expansionary monetary policy, they are not sustained in the long run and are earned only at the cost of a higher rate of inflation.[37]

b. Government debt and national wealth

Even if there is no crowding out in the credit markets, many economists believe that increases in deficits do not stimulate aggregate demand. According to this school of thought, fiscal policy changes provide no net stimulus because individuals receiving a tax cut or the income from increased government expenditures recognize that additional disposable income realized today will be offset by tax increases in the future that will be assessed to support the current increase in the deficit.[38] For example, it is widely believed that consumption is a function of consumers' wealth, which includes the value of assets net of debt obligations plus the present value of future earnings. Because cuts in capital taxes increase the value of capital and cuts in wage taxes increase the present value of future earnings, tax cuts, especially permanent tax cuts, are believed to increase wealth and therefore increase consumption. However, many economists would argue that wealth is really not increased when increased future tax obligations (necessary to fund the current debt) are taken into account.

It may be improbable that all consumers fully take into account increased future tax obligations that result from an increase in the current government deficit. However, it does seem plausible that an increase in personal wealth result from a tax cut financed by an increase in public debt is less stimulative than a real increase in wealth resulting from higher pre-tax income.

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[37] Milton Freidman, "The Role of Monetary Policy," *American Economic Review*, vol. 58 (March 1968), pp. 1-17.

[38] This proposition is known as the "Ricardian equivalence" theorem. For more discussion, see Robert Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy*, vol. 82, November-December 1974. Ricardian equivalence does not necessarily hold in an economy where consumers and businesses are unable to obtain sufficient credit to meet their demands. In that case, when the government borrows to put cash in the hands of its citizens through lower taxes or increased spending it is, in effect, borrowing on their behalf. Accordingly, government borrowing may have some impact on output even though consumers perceive the future tax liability because in effect they get a loan for consumption through the government that they would not otherwise be able to obtain.

c. Prices and expectations

Standard Keynesian analysis assumes that increases in aggregate demand have little or no impact on the level of prices. When changes in the price level are taken into account, expansionary Keynesian policy may increase inflation as well as the level of employment. This is all the more likely the closer the economy is to full employment (as defined above). Therefore, any benefits of increased output and employment of Keynesian policy must be weighed against the costs of potentially higher inflation.

The ability of prices and wages to adjust weakens the whole conceptual basis of Keynesian analysis. If prices adjust (as they should in an efficient market economy), there really can be no unemployment except that which is "voluntary" or that which is temporary until sluggish wages and prices do adjust. If involuntary unemployment is only temporary, the benefit of fiscal policy may only be short-lived. Critics of activist macroeconomic policy argue that because wages and prices will adjust anyway, there is no substantial benefit from any attempt at activist fiscal management of the economy.[39]

If wages and prices adjust rapidly to changes in circumstances, critics of activist policy argue that stimulating aggregate demand may only serve to increase inflation. Fiscal stimulus may temporarily increase employment because when the price level increases in response to increased demand, workers are offered higher wages, but do not immediately realize that these apparent gains have been offset by a higher cost of living. During this period there may be an expansion of production because "workers are fooled" by higher nominal wages, but this expansion is only temporary until workers realize their real wages have not increased. In the long run, the fiscal policy multipliers are zero; thus, there is no long-run increase in employment from Keynesian aggregate demand stimulus.[40]

2. Practical problems of implementing fiscal policy

a. Keynesian policies are inappropriate for recessions due to supply shocks

All of the traditional Keynesian responses discussed here are responses to "demand-shock" recessions. As noted above, not all recessions are the result of deficiencies in aggregate demand. The two major recessions of the 1970s were primarily the result of major oil price increases that resulted in reductions in aggregate supply. There is also some evidence that the 1990-91 recession, at least in part, was the result of the spike in oil prices resulting from the August 1990 Iraqi invasion of Kuwait.[41]

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[39] These economists also argue that even if it is theoretically possible for government policy to help direct the economy toward full employment and therefore derive at least some short-term benefit from policy, practical implementation problems make this possibility unlikely. This is discussed in more detail below.

[40] When economists incorporate "rational expectations" into their models, unless macroeconomic policy is random, workers on average will anticipate policy and will not be fooled by it. Therefore, macroeconomic policy cannot increase employment, even in the short run. Only erratic policy changes that workers cannot anticipate can have an effect on real output of goods and services, and these changes will only be temporary.

[41] See, *The 1991 Economic Report of the President*, pp. 80-81.

Fiscal policies are poorly suited to help fight recessions that solely are the result of supply shocks. If a supply-side recession is not recognized as such and expansionary fiscal policies are implemented, the result may be more harmful than beneficial. For example, if expansionary fiscal policies were pursued in response to high unemployment during a supply-shock recession, the result could be little increase in employment and a further acceleration of inflation because the economy might already be at full employment.

b. Uncertainty about the correct amount of fiscal stimulus

Even if the recession is of the demand variety, there are numerous practical problems with the implementation of fiscal policy.

Closing the gap between actual and potential GNP

Fiscal policy cannot be guided simply by reaction to the levels of inflation, employment, or economic growth. For example, it is difficult to judge what level of unemployment justifies government intervention. Although at first it may seem desirable to eliminate unemployment entirely, most economists agree that there is some "natural" rate of unemployment. Economists note that this unemployment results from normal job turnover as workers cannot usually start a new job as soon as an old job ceases. Any attempt to utilize expansionary fiscal policy to reduce unemployment below the natural rate would be inflationary. Similarly, not all inflation can or should be reduced by contractionary fiscal policy. The oil price shocks of the 1970s had little to do with excess aggregate demand, and any efforts to reduce this inflation with contractionary fiscal policy would have only exacerbated unemployment and prolonged the recession by decreasing aggregate demand in an economy already subject to a supply shock.

Fiscal policy can only increase employment in a recession to the degree aggregate demand falls short of output achievable at full capacity. (This shortfall is sometimes known as the "deflationary gap.") Fiscal policy can only reduce inflation in an economic expansion to the extent there is an excess of aggregate demand over the output of an economy at full capacity (the "inflationary gap"). Ideally, fiscal policy would be designed to close the gap between actual GNP and "potential GNP" of an economy utilizing its full productive capacity. (This gap over the 1970–1991 period is illustrated in Figure 8 of Part II.) Unfortunately, precise measurement of GNP requires some time for data collection, and often the figures first released are revised. Furthermore, potential GNP is a concept that can never be estimated precisely. In sum, the goal of Keynesian fiscal policy is to close the gap between actual and potential GNP, but that gap can never be measured precisely.

Even if the size of the gap between actual and potential GNP were known, implementation of activist fiscal policy still could not proceed smoothly because of the uncertainty about the degree to which a given change in fiscal policy can close the gap since there is a great deal of uncertainty about the size of fiscal policy multipliers. Empirical evidence from econometric models provides some

evidence, but no two models yield the same results.[42] Furthermore, these multipliers will vary according to whether the economy is an expansion or a recession, and according to whether the policy is a temporary or permanent change. Because of this "multiplier uncertainty," even advocates of fiscal policy acknowledge that policymakers should only attempt partially to close the gap between actual and potential GNP.[43]

Uncertain effect of taxes on consumption

If fiscal policy is implemented through changes in taxes (as opposed to changes in government expenditures), the degree of uncertainty about the effects of fiscal policy is greater since it is difficult to gauge the effect of tax changes on private behavior. One difficulty arises because of widely acknowledged differences between temporary and permanent tax cuts. Because consumption is believed to be a function largely of lifetime or "permanent" income, tax cuts that are small and temporary are not believed to have a significant impact on consumption expenditures, except to the degree that consumers are unable to obtain credit and the tax cut increases their cash flow. Economists generally believe that a permanent income tax reduction will have a substantially larger effect than a temporary income tax reduction.[44]

Uncertain effects of taxes on investment

The effects of tax cuts for business expenditures on investment are also the subject of controversy. There is a long-standing dispute in the economics profession as to whether tax reductions for capital spending—such as the availability of accelerated methods of depreciation or investment tax credits—have any substantial impact on investment expenditures.[45] These investment incentives reduce the cost of capital, but there is no consensus about the responsiveness of investment to changes in the cost of capital.[46] Whatever the impact, it is likely that temporary incentives for investment have different impacts than permanent incentives. To stimulate aggregate demand, temporary tax credits may have more potential than permanent tax credits (even if they have no long-term impact on the overall productive capacity of the economy) because they can cause businesses to accelerate investment spending.[47]

Illustration of possible Keynesian stimulus of a tax cut

Although macroeconometric models that were held in wide esteem 20 years ago have been the subject of a great deal of criti-

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[42] See Gary Fromm and Lawrence R. Klein, "A Comparison of Eleven Econometric Models of the United States," *American Economic Review*, vol. 63 (May, 1973), p. 392, Table 6.

[43] See William Brainard, "Uncertainty and the Effectiveness of Policy," *American Economic Review*, vol. 57 (May 1967), pp. 411-425.

[44] Alan S. Blinder, "Temporary Income Tax Changes and Consumer Spending," *Journal of Political Economy*, February, 1981.

[45] For example, see Dale W. Jorgenson, "Econometric Studies of Investment Behavior: A Survey," *Journal of Economic Literature*, Vol. 9, December 1971; and Robert Eisner, "Econometric Studies of Investment Behavior: A Comment," *Economic Inquiry*, Vol. 12, 1974, pp. 91-103.

[46] See Part V of this pamphlet for a further discussion of the effectiveness of investment expenditures.

[47] Similarly, an explicitly temporary reduction (or an announced future increase) in excise taxes may be effective in quickly shifting aggregate demand as consumers speed up purchases in anticipation of higher taxes.

cism,[48] it is useful for purposes of illustration to examine their estimates of fiscal policy multipliers. These models rarely estimate the ratio of the increase in real GNP to a permanent reduction in taxes (both in constant dollars) to be greater than 2.[49] If this is correct, a permanent tax reduction with an annual cost of $10 billion dollars (and without any offsetting policy to prevent a full $10 billion of revenue loss) can at most increase real GNP by $20 billion. In a $5.5 trillion economy, this is an increase in real GNP of less than 0.36 percent. Using a rule of thumb sometimes employed by economists,[50] this could be expected to translate into a reduction of the unemployment rate by 0.18 percentage points. Thus, under favorable assumptions regarding the effectiveness of tax cuts on aggregate demand, in an economy with an unemployment rate of 6.8 percent, the fiscal stimulus of a tax cut with an *annual* cost of $10 billion can be expected to reduce unemployment to no less than 6.6 percent. Most economists believe tax reduction multipliers are lower and, accordingly, would estimate even smaller effects of taxes on GNP and unemployment.

c. Policy lags and uncertainty about the timing of fiscal policy

In addition to the significant theoretical and practical objections to using fiscal policy to mitigate business cycles, perhaps the greatest involves the timing of policy changes. Unfortunately, macroeconomic indicators are difficult to interpret and implementation of macroeconomic policies is clumsy. Therefore, even if fiscal policy can be justified theoretically, difficulties in practical implementation may greatly limit its utility as anti-recessionary policy.

Recognition lag.—The first problem is timely recognition of the need for fiscal policy. It may takes several weeks or months for reliable economic data to be collected. Then a pattern regarding the direction of the economy may not be discernible for several additional months. Although macroeconometric forecasting models may provide some ability to foresee economic conditions, the accuracy of these models may not be sufficient to warrant changes in policy.

Implementation lag.—The second potential problem involves the time between recognition of need for fiscal policy and the actual implementation of change. It may take many months for a major tax bill to work its way through the legislative process and onto the President's desk.[51] In addition, there may be a lag between the

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[48] See, for example, Robert E. Lucas, "Econometric Policy Evaluation: A Critique," *Journal of Monetary Economics*, Suppl. Series, 1976, Vol. 1, pp. 19-46.

[49] See Gary Fromm and Lawrence R. Klein, "A Comparison of Eleven Econometric Models of the United States," *American Economic Review*, vol. 63 (May, 1973), p. 392, Table 6.

[50] "Okun's law" (named after Arthur M. Okun, former Chairman of the Council of Economic Advisors) is the empirical relationship between a percentage change increase in GNP and a percentage point decline in the unemployment rate. It has been estimated that a one percent increase in GNP translates into 0.5 percentage point decline in the unemployment rate. See, George Perry, "Potential Output and Productivity," *Brookings Papers on Economic Activity*, vol. 8, no. 1 (1977), p. 11-47.

[51] The policy implementation lag could be reduced by structural changes in the tax policy-making process. For example, tax cuts, whose form could be agreed upon in advance, could be made contingent upon triggers in certain economic indicators, for example, two successive quarters lacking real economic growth. In order to increase the responsiveness of fiscal policy to changing economic conditions, the Kennedy Administration proposed stand-by authority for certain government capital expenditures and tax cuts pre-approved by Congress. If certain econom-

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date of enactment and the effective date of the legislative provisions.[52]

Effectiveness lag.—Even after a fiscal policy is enacted, the bulk of its effects on the economy may not occur for many more months.[53] Furthermore, different policies will have different effectiveness lags. For example, a widely anticipated, explicitly temporary incentive for investment that may be placed into service relatively quickly may have a shorter effectiveness lag than a permanent tax incentive for self-constructed capital assets.

These potentially lengthy lags can easily push the effects of a fiscal stimulus enacted in response to a recession well into the period of economic recovery. If that occurs, the fiscal policy may, in fact, be destabilizing and inflationary. In order to be effective, countercyclical policies must be timed with a fair degree of accuracy. The history of discretionary fiscal policy since World War II provides little reassurance to those who look to government policy as a means of fighting recessions.[54]

Automatic stabilizers

In addition to discretionary fiscal-policy changes, business cycles may also be dampened by fiscal-policy changes that are not the result of any change in law. These "automatic stabilizers" include the automatic reduction of tax receipts and increase in transfer payments that result during a recession. Automatic stabilizers have the distinct advantage over discretionary changes in that they generally are not subject to recognition and implementation lags. To the extent that Keynesian policies were thought to be effective, expansion of countercyclical expenditure programs and development of a more procyclical tax structure could reduce macroeconomic fluctuations.

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ic conditions were met, the President could then exercise this authority. See, *1962 Economic Report of the President*, pp. 72-76. The Nixon Administration also proposed streamlining procedures for enactment of temporary tax surcharges and tax credits in order to allow quick implementation of fiscal policy. See, *1973 Economic Report of the President*, p. 75.

[52] For example, a simple change in individual income tax rates, which could be implemented through revised withholding tables, would require the Internal Revenue Service (IRS) to draft, print, and mail new withholding tables and instructions to approximately 10 million employers. In addition, third-party software vendors, who sell programs to compute employee withholding, would need to modify and distribute new software that incorporate these changes. It is likely that these actions would take at least two months to complete. Other tax changes, such as new tax credits or changes in exemptions, which would require the IRS to revise the W-4 form and send it out to over 100 million employees, could take considerably longer. The implementation lag could be considerably lengthened by the slow response from individual employers and taxpayers.

[53] Although some effects may take place as soon as a policy is enacted, large-scale econometric models typically do not register peak effects of permanent tax changes for one to three years. See Gary Fromm and Lawrence R. Klein, "A Comparison of Eleven Econometric Models of the United States," *American Economic Review*, vol. 63 (May, 1973), p. 392, Table 6.

[54] For a summary and evaluation of discretionary fiscal policy in the postwar United States, see Robert J. Gordon, *Macroeconomics* (Boston: Little Brown, 1981), pp. 517-521.

V. EFFECTS OF TAX POLICIES ON AGGREGATE SUPPLY

Part II of this pamphlet reviewed the output, saving, investment, and productivity trends in the United States economy: over the last 20 years the United States economy has been growing more slowly, saving less, and investing less in comparison both to the historical United States pattern and to other countries. Many observers are concerned about the implications of these slow growth rates for the future living standards of United States households and believe that it is important to counteract these trends with changes in government policies.

The productive capacity of an economy, or its aggregate supply, is determined by the amount and quality of its labor, capital, and natural resources and the level of its technology. Tax policies may be able to increase an economy's aggregate supply by increasing the economic return to working, saving, and investing. For instance, lowering income and payroll taxes increases the return to working; lowering taxes on interest, dividends, and capital gains increases the return to saving; lowering business taxes increases the return to investment. It is possible that by increasing the return to working, saving, and investment, people may choose to engage in these activities more. However, it is also possible that these policies may not induce increases in these activities. A reduction in the size of the Federal budget deficit may also increase aggregate supply to the extent national saving increases.

A. General Effects of Aggregate Supply Incentives

1. Effects of aggregate supply incentives on work effort, saving, and investment

Even in theory, the effects of aggregate supply incentives on private behavior are ambiguous. Policies that lower income taxes, lower payroll taxes, or provide tax credits based on earnings increase the after-tax return individuals receive from working. This can have two effects on work effort. First, since each hour of work yields a greater return (i.e., a higher after-tax wage), people might choose to work more. Second, since these tax cuts increase people's disposable income, they might choose instead to work less—for instance, by working fewer hours per week, taking more vacation time, or giving up a part-time job. Either effect may predominate. Thus, payroll and income tax cuts have a theoretically ambiguous impact on work effort and on productive capacity.

Similarly, a reduction in taxes on capital income (interest, dividends, and capital gains) increases the rate of return to saving. One effect of the increased return to saving is to encourage people to save more. However, the tax cut also increases current (and future, if the tax cut is permanent) income; people may respond to

this increased income by choosing to consume more and work less, thereby depressing saving and work effort.

Further, there are two ways tax policies can encourage investment. First, tax policies that increase domestic saving may also increase domestic investment. It is likely that an increase in domestic saving resulting from tax cuts on capital income will be channeled into both increased domestic and foreign investment. Second, domestic investment itself (as opposed to saving) can be encouraged. Investment by domestic businesses can be encouraged by lowering the corporate income tax rate, providing an investment tax credit, or increasing the value of depreciation deductions. Each of these aggregate supply policies reduces the effective tax rate on investment.

It is possible that the inframarginal effects of investment incentives may reduce overall investment. When a firm's taxes are reduced, its after-tax profits increase. This increase in profits will lead to higher share prices and higher dividend payments, increasing the income and wealth of stockholders. If stockholders respond to this increased income by increasing consumption, then saving will decrease, and overall investment may decrease as well. However, this demand-side effect is probably less strong with investment incentives than with saving or work incentives, both because some of the shareholders of United States firms are foreigners (much of their increased consumption will take placed outside the United States) and because individuals' consumption may respond less to increases in the value of their shares than to reductions in their income taxes.

These examples illustrate the two effects generally associated with reductions in tax rates. The first effect (the "substitution effect") is that associated with increasing the return on the marginal unit of work, saving, or investing. By increasing the return on the margin, consumers are induced to increase work effort or their amount of saving, and firms are induced to increase investment. The second effect (the "income effect") is that tax cuts generally increase the inframarginal return, that is, the total after-tax wages received from work effort already undertaken, the total after-tax income received from past and already planned saving, and the total profits received from existing investments. Thus, the tax cuts also increase the income of consumers. Because increased income is generally believed to reduce labor supply and to increase consumption, the inframarginal effects of tax cuts work in a direction opposite to that of the marginal effect, and work in the same direction as standard demand-inducing tax policies.

2. Effects on national saving

Beyond the effects on private saving, policies that provide incentives to increase aggregate supply also may affect government saving. Because national saving is equal to the sum of government and private saving, judgments concerning aggregate supply policies must take into account their effects on both private and public saving.

The effects of supply policies on public saving can be viewed as the sum of the revenue impact of the policy without consideration of behavioral responses to the tax cut and the revenue effect of the

behavioral responses. The increased income that people receive as a result of reduced tax rates on their wages or their capital income is equivalent to a transfer of income from the government to taxpayers. If this transfer is financed by increased borrowing (i.e., by increasing the deficit), then government saving declines. Individuals may also respond to both the increased income and the increased after-tax rate of return by changing their work effort or their amount of saving. These changes also affect government revenue. If tax cuts increase work effort, saving, or investment, the government may collect additional tax revenue. If tax cuts reduce these activities, then government revenues could fall even more.

Thus, the effects of supply policies on national saving and on growth depend on the degree to which the policies increase the return to activities already being undertaken (i.e., how much they increase inframarginal returns) and on the magnitude of the behavioral effects associated with the increased marginal rate of return. To be effective, supply policies should provide higher returns from marginal increases in work, saving, and investment, while minimizing the increased return to activities already being undertaken.

B. Effectiveness of Specific Aggregate Supply Policies

1. Policies to increase work effort

a. Reductions in FICA taxes

FICA taxes (the payroll taxes on employees and employers to finance Social Security and Medicare benefits) reduce the after-tax wages received by workers.[55] FICA tax reductions increase after-tax wages, and may provide increased incentives to work. Two issues determine the effectiveness of FICA tax reductions in increasing labor supply: first, the degree to which a particular policy reduces marginal payroll taxes, and second, the general effect of payroll tax cuts on labor supply.

FICA taxes do not affect the marginal tax rate on labor income for all workers. Because the FICA payroll tax only applies to wages below certain thresholds (in 1991 these thresholds are $53,400 for the portion for old-age, survivors, and disability insurance and $125,000 for the portion for Medicare part A hospital insurance) and does not affect the after-tax wage for earnings beyonds these amounts, reducing the payroll tax has no effect on the marginal tax on work effort for wage earners earning more than the income threshold. Since FICA tax reductions provide no reduction in marginal taxes for those wage earners who are beyond the threshold, FICA tax reductions should be viewed simply as income transfers to these taxpayers.

For workers earning less than the FICA income threshold, FICA tax reductions reduce the marginal tax on wages, thereby increasing the return workers receive for every hour they work. The effect of reduced taxes on work effort is uncertain. As described above, there are two effects of reduced taxes on work effort. First, the in-

[55] FICA stands for the Federal Insurance Contributions Act. Self-employed individuals pay a similar levy, called SECA (Self-Employed Contributions Act) taxes. This discussion assumes that any reduction in FICA taxes would also be accompanied by a similar reduction in SECA taxes.

creased return from each additional hour of work should encourage workers to work more. Second, the increased after-tax income (from the reduction in taxes) workers receive may cause them to choose to take more leisure, and work less.

The empirical evidence on the effects of labor taxes on work effort is mixed. In general, the evidence indicates that the labor supply responsiveness to tax cuts is small. Some groups of workers seem to respond more to lower labor tax rates. Secondary earners (for example, married women with working husbands) have been found to increase their labor supply in response to increased wages.[56]

b. FICA-based tax credits

FICA-based tax credits reduce income tax liabilities by some amount related to a taxpayer's FICA tax payments. Because FICA taxes are only assessed on wages, FICA-based tax credits are essentially reductions in wage taxes. FICA-based tax credits are often capped, and may or may not be refundable.

FICA-based tax credits may be less likely to affect the marginal tax rate on wages than direct FICA tax reductions. If the FICA-based tax credits are capped (for instance, the credit might be equal to 5 percent of FICA taxes paid, with a maximum credit of $100), taxpayers receiving the capped amount receive no reduction in the marginal tax rate on their work effort. Similarly, if the tax credits are nonrefundable, they provide no reduction in payroll taxes for people without a positive income tax liability.

c. Temporary FICA-based tax credits

Temporary FICA-based tax credits are likely to elicit a larger immediate labor supply response than permanent credits. Temporary credits have a much smaller effect on taxpayers' wealth and thus are less likely to induce people to reduce their work effort and consume more leisure. Furthermore, because the credits are only temporary, people may choose to put off leisure and increase their work effort during the period that taxes are low. However, because the response to temporary tax cuts is only temporary, such tax cuts cannot be viewed as significant long-run aggregate supply policies.

2. Policies to increase saving

a. In general

Tax policies to increase saving generally involve reducing the tax rate on capital income. Theoretically, the effect on saving of a reduction of taxes on capital income is ambiguous. Again, there are two effects. First, the increased return to saving should encourage people to save more. Second, the increased return people receive on assets they have already accumulated and on saving they had already planned increases their income. This increased income will encourage them to increase their consumption and may reduce their saving.

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[56] For a review of the research on the responsiveness of labor supply to changes in taxes, see Jerry Hausman, "Labor Supply" in Alan Auerbach and Martin Feldstein, eds., *Handbook of Public Economics, vol. I.* North-Holland (1985).

Substantial disagreement exists among economists about the effects on saving of increases in the net return to saving. Some studies have argued that from a theoretical perspective one should expect substantial increases in saving from increases in the net return.[57] Other studies have argued that large behavioral responses to changes in the after-tax rate of return need not occur.[58] Empirical investigation of the responsiveness of personal saving to after-tax returns provides no conclusive results. Some find personal saving responds strongly to increases in the net return,[59] while others find no response or even a negative response.[60]

Assuming that cutting taxes on capital income does increase the saving rate, what is the potential magnitude of the response? A 10 percent reduction in individual marginal tax rates would change the current bracket structure of 15 percent, 28 percent, and 31 percent tax rates to 13.5 percent, 25.2 percent, and 27.9 percent, respectively. This tax rate reduction would increase the after-tax return from saving by 1.8 percent for taxpayers in the current 15 percent tax bracket, 3.9 percent for taxpayers in the current 28 percent bracket, and 4.5 percent for taxpayers in the current 31 percent bracket.[61]

For the purposes of illustration, assume that most savers are in the 31 percent marginal tax bracket. Using one of the economic literature's larger estimates of the responsiveness of saving to increases in the after-tax rate of return,[62] a 4.5 percent increase in after-tax return would increase saving by 1.8 percent. Only individual taxpayers' saving would increase as a result of the tax cut. (Note that many institutional investors, such as pension funds, are tax exempt.) These individual taxpayers save roughly $220 billion per year. A 1.8 percent increase would translate into an additional $4 billion of saving a year by individuals. That extra private savings would increase the national saving rate by less than one-tenth of one percentage point.

b. Specific savings incentives

Individual retirement arrangements[63]

Individual retirement arrangements (IRAs) permit taxpayers to save a certain amount every year without paying tax on the accu-

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[57] See, Lawrence H. Summers, "Capital Taxation and Accumulation in a Life Cycle Growth Model," *American Economic Review*, 71, September 1981.

[58] See, David A. Starrett, "Effects of Taxes on Saving," in Henry J. Aaron, Harvey Galper and Joseph A. Pechman (eds.), *Uneasy Compromise: Problems of a Hybrid Income-Consumption Tax*, Brookings Institution, 1988.

[59] See, Michael J. Boskin, "Taxation, Saving, and the Rate of Interest," *Journal of Political Economy*, 86, April 1978.

[60] See, G. von Furstenberg, "Saving," in Henry Aaron and Joseph Pechman (eds.), *How Taxes Affect Economic Behavior*, Brookings Institution, 1981.

[61] For each $1 of return before tax, the taxpayer earns $(1-marginal tax rate) after tax. For example, a taxpayer in the 31 percent bracket earns 69 cents after tax for each dollar of pre-tax return. Thus a reduction in the marginal rate from 31 percent to 27.9 percent will increase the after-tax return from 69 cents to 72.1 cents—an increase of 4.5 percent [.045 = (72.1-69)/69.]

[62] An interest elasticity of savings of .4 was estimated by Michael J. Boskin in his paper, "Taxation, Saving, and the Rate of Interest," *Journal of Political Economy*, 86, April 1978. This means that a 10 percent increase in the after-tax return to saving would result in a 4 percent increase in the amount of saving undertaken.

[63] For a more detailed discussion of the economics of IRAs and their effectiveness at promoting saving, see Joint Committee on Taxation, *Description and Analysis of S. 612 (Savings and Investment Incentive Act of 1991)* (JCS-5-91), May 14, 1991.

mulated earnings. Present-law IRAs allow individuals to deduct their IRA contributions from their income, but include the entire amount (the original deductible contribution plus any earnings) in income when withdrawn. If the taxpayer's tax rate is the same in the year the contribution is made as it is in the year the funds are withdrawn, a deductible IRA (a "front-loaded" IRA) is economically equivalent to an IRA that does not permit the contribution to be deducted from gross income, but that does not tax either the principal or the earnings when the funds are withdrawn (a "back-loaded" IRA).

In this sense, IRAs effectively allow taxpayers to earn a tax-free rate of return on the funds in the IRA. Therefore, the availability of IRAs may affect the total amount of private saving. However, as with other tax credits or tax reductions, the effect of IRAs on saving is uncertain. First, it is not clear that IRAs reduce the tax on the last dollar of income saved (i.e., the marginal tax rate on this activity). Second, even if IRAs do reduce the marginal tax rate on saving, their effectiveness at increasing saving is uncertain.

IRAs may not increase the return on the last dollar saved because IRAs typically limit the amount of assets annually eligible for favorable tax treatment. Under present law, the limit on annual contributions generally is $2,000 per year. Taxpayers with current savings of more than $2,000 can simply shift these assets into IRAs.[64] Any additional saving these taxpayers might contemplate will not receive the favorable tax treatment until the remainder of their assets has been shifted into IRAs. Taxpayers who generally save more than $2,000 per year do not receive favorable tax treatment on additional saving. When existing assets or planned saving is shifted into IRAs, taxpayers essentially receive a transfer of income from the government. Because this transfer increases their wealth, the only likely effect is for taxpayers to increase their consumption, which decreases private saving from the level that would otherwise have occurred. Furthermore, if this transfer is financed by government borrowing, national saving—the sum of private and public saving—will decline.

In 1986, the availability of deductible IRAs was eliminated for taxpayers who had income over certain thresholds and were active participants in employer-sponsored retirement plans. These income limits were not indexed for inflation, and hence their real values have eroded over time. Current projections estimate that roughly 18 percent of all tax returns and 32 percent of joint tax returns are filed by taxpayers who are ineligible to deduct any IRA contribution.[65]

Increasing and indexing the eligibility limits would ensure that the percentage of taxpayers eligible for IRAs would not erode over time due to inflation.[66] It is uncertain whether increasing the eligi-

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[64] Because IRAs are less liquid than other forms of saving, individuals with more than $2,000 may not choose to shift all of that amount into an IRA. Thus the availability of IRAs may provide a marginal incentive to long-term saving even for individuals who save more than $2,000 per year.

[65] See JCS-5-91, referenced above.

[66] Eligibility would still erode over time if the income limits were indexed only for inflation, since the economy generally also experiences real growth in incomes over time.

bility limits would merely extend tax-favored treatment to taxpayers already likely to save $2,000 per year, or whether increasing the limits would actually provide a marginal incentive to save for more taxpayers.

Reducing the capital gains tax rate [67]

Capital gains taxes reduce the after-tax rate of return from certain types of saving—saving in the form of assets such as stocks, real estate, and housing. Reductions in the tax rate on capital gain income therefore represent an increase in the rate of return to certain types of saving.

Because capital gains taxes are only paid when taxpayers sell their assets, the tax system provides an incentive for taxpayers to hold on to their assets instead of selling them. By holding on to their assets, taxpayers receive tax deferral. Moreover, since the income tax liability for any accrued gain on capital assets is forgiven at death, holders who intend to make bequests may rationally choose to hold on to these assets and to pass them on to heirs. These incentives are often referred to as the "lock-in" effect and may result in inefficient distribution of portfolio holdings. Lowering the capital gains tax rate would provide one way of reducing the lock-in effect.

That there exists a large stock of unrealized, possibly locked-in capital gains also implies that much of the benefit of reduced taxes on capital gains will go to existing capital. Thus, a tax rate reduction on capital gains would give taxpayers with existing accrued capital gains a windfall on their old investment. In terms of overall national saving, the recoupment of government revenue through additional realizations may be offset by increases in private consumption.

Because most proposals that provide reductions in capital gains tax rates do not limit the tax reduction to a particular amount of capital gains, capital gains tax reduction proposals do increase the after-tax return on the last dollar of investment. However, because the tax reductions apply only to certain classes of assets, one effect of reductions in the capital gains tax rate would be to encourage people to change the form of their saving—from assets that generate current income (e.g., certificates of deposit, checking accounts, bonds) to assets like corporate stocks and real estate. For this shifting of saving to increase the growth rate of the economy, the latter forms of saving must promote growth more than the forms of saving being discouraged.

Deficit reduction

National saving is equal to the sum of private and public saving. When the government borrows, public saving falls. If this decline in public saving is not met by an increase in private saving of a similar magnitude, national saving also falls. Thus, one way to increase national saving would be to decrease public dissaving by reducing the deficit. If taxes were increased to reduce the deficit, it is

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[67] For a detailed discussion of issues relating to taxation of capital gains and losses, see Joint Committee on Taxation, *Proposals and Issues Relating to the Taxation of Capital Gains and Losses* (JCS-10-90), March 23, 1990.

likely that part of the tax increase would come from funds that individuals would otherwise have saved, but part would come from funds that individuals would have otherwise consumed.[68] The net increase in saving would be equal to the decrease in government dissaving less the decrease in private saving.

The disadvantage of increasing national saving by increasing taxes is that most taxes distort behavior and thereby introduce inefficiency (in terms of the allocations of resources) into the economy. This inefficiency increases as tax rates increase. Thus, any policies that could increase national saving without increasing marginal tax rates would be more efficient than policies that increase saving while increasing marginal tax rates.

3. Policies to increase investment

a. In general

In a closed economy (no international trade or investment), all individual saving is ultimately invested in the economy, and saving is equal to investment. In an open economy (where goods and capital can flow freely from one country to another), investment and saving need not be the same. Saving by United States residents may be invested in the United States or abroad, and saving by foreigners may be invested in the United States. However, there is a strong empirical relationship between a country's saving rate and its investment rate, with countries such as Japan having both high investment rates and high saving rates, and countries such as the United States having low saving and investment rates.[69]

Thus, policies that stimulate the United States saving are likely to stimulate United States investment as well. However, other policies can more directly stimulate United States investment. In particular, tax policies that increase the return to investing in the United States may be more effective at increasing the amount of United States investment. This increased investment is likely to be financed both by foreign and domestic saving.

When firms make investment decisions, they must decide whether the investment yield will be as great as the yield on the next best alternative use of the investment funds (the "opportunity cost" of the funds). This opportunity cost of investment funds is called the cost of capital. When the cost of capital is low, a greater number of investments will be determined to be profitable. Thus, the lower the cost of capital, the higher the level of investment.

The cost of capital for corporations is determined by the rate of return they have to offer to shareholders and debtholders, as well as by the corporate tax on investment income. The higher the corporate tax, the more an investment has to earn before taxes in order to provide any given rate of return to shareholders.

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[68] See the discussion of "Ricardian equivalence" above in Part IV. Because increased government borrowing will eventually result in increased future taxes, taxpayers may react to a tax cut financed by increased borrowing by saving the entire amount of the cut. Similarly, taxpayers may react to a tax increase used to reduce the deficit by decreasing private saving. According to this view of taxpayer behavior, changes in government saving policy can influence public saving and private saving, but will not affect national saving. See, Robert Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy*, 82, 1974.

[69] Feldstein and Horioka, *op. cit.*

Corporate taxes reduce the after-tax return from equity-financed investments, and thus increase the cost of capital. Generous depreciation allowances and investment tax credits may reduce the tax liability associated with investment income and may therefore decrease the cost of capital.

Because a country's saving rate is closely related to its investment rate, supply policies that increase the marginal rate of return to private investment at the cost of increased public borrowing may not actually stimulate investment. Tax policy's effectiveness at increasing investment depends on the magnitude of the effect of tax cuts on investment, and on the degree to which particular policies reduce marginal taxes without reducing government revenues. Policies that reduce taxes on existing capital provide windfall benefits to capital owners and reduce government revenues. If such benefits are financed by government borrowing, then national savings will fall.

b. Specific tax incentives for investment

Reductions in corporate tax rates

Because reductions in corporate income tax rates reduce the cost of capital, they should increase investment. However, much of the benefit of reduced corporate taxes would accrue to income on existing assets. For example, a reduction in corporate taxes would reduce not only the taxes on profits from new investment, but also on profits from investments that were undertaken in the past. The increased profits on these old investments would result in higher share values for stocks, and hence benefit owners of existing capital.

Investment tax credits

Investment tax credits (ITCs) provide an income tax subsidy for the purchase of investment goods, effectively reducing the purchase price of these goods. This lowers the cost of capital, and should encourage investment. Furthermore, if ITCs are made available only on new assets, they will not provide the windfall to existing capital that reductions in the corporate tax rate will.

Incremental investment tax credits

Incremental investment tax credits provide a credit for the purchase of investment goods in excess of a specified base amount. The purpose of making an investment tax credit incremental is to reduce the windfall provided to investors by reducing or eliminating the credit on investment they would have done in the absence of the credit. Incremental investment tax credits can theoretically provide the same increased incentive to invest at a lower cost to the government than a non-incremental ITC. However, incremental investment tax credits present new difficulties. To maximize the efficiency of these credits, the base would ideally be set equal to the amount firms would invest in the absence of the credit. If the base is set too high, many taxpayers may not be eligible for the credit, reducing the credit's overall incentive and creating a distortion between investment of eligible and ineligible taxpayers.

Accelerated depreciation

Increasing the rate at which investment can be depreciated for income tax purposes also lowers the cost of capital. If accelerated depreciation is only granted to new assets, the effect on investment and the windfalls granted to owners of existing capital will be identical to those of an ITC (i.e., there is an investment tax credit rate that will yield identical results to any given accelerated depreciation scheme).

VI. EFFECTS OF FISCAL POLICY ON INCOME DISTRIBUTION

In general

Federal fiscal policy affects income distribution in the United States in several different ways. Redistribution occurs directly by transferring revenues raised through a Federal tax (e.g., the Federal individual income tax) to others via direct spending programs (e.g., to lower-income households through the Food Stamp program). This type of transfer directly affects the ultimate distribution of income in the economy. The Federal tax and transfer system also redistributes income indirectly by taxing or subsidizing various activities (e.g., by taxing wage income or by providing tax credits to investors in certain rental housing properties for lower-income households). By taxing income, the Federal tax system tends to discourage some income-producing activities. To the extent individuals have discretion in choosing the amount of labor provided or the amounts and type of saving undertaken, levying taxes on these activities may reduce the amount undertaken. Changes in the amounts of these activities will affect the observed distribution of income in the economy.

Little economic research has been done on the redistributional effects (both direct and indirect) of the entire Federal tax and transfer system. Instead, the individual effects of the separate systems have been studied, more or less in isolation. In presenting the results of this analysis, a similar strategy is followed here. First, an overview of the trends in pre-tax income distribution is presented. This overview points out that income growth in the United States has slowed considerably since the mid-1970s, in contrast to the rate of growth in the previous 25 years. Moreover, the degree of pre-tax income inequality has also increased, especially over the past 10 to 15 years. Second, the role of the Federal tax system in redistributing income is considered. On the whole, the Federal tax system is generally considered to be progressive, in that the burden (measured by average tax rates—total taxes paid divided by total income) imposed on higher-income individuals tends to be larger than that imposed on lower-income individuals. However, the degree of progressivity appears to have declined over time. Finally, these components are brought together, and information on the post-tax income distribution is presented. The evidence indicates that the Federal tax system acts to somewhat reduce the degree of pre-tax income inequality. However, the impact of the Federal tax system is not large enough to offset completely the growing pre-tax income inequality in the United States.

Pre-tax income distribution

Numerous studies have documented two main features of pre-tax earnings over the past three decades.[70] The first is a slowdown in the rate of earnings growth beginning around 1973. For example, disposable income per full-time worker grew at an annual rate of over 2 percent during 1947–1973, but at a rate of less than 0.75 percent per year during 1973–1989.[71] The second feature is a growing inequality in earnings, particularly a sharp increase in the earnings inequality among males. This trend toward increasing inequality appeared to start around 1978 and has not abated. Economists are nearly unanimous in their observations of these trends in earnings and earnings inequality. However, there is yet no consensus on the causes.[72]

Table 6 presents median family income and median household income over the period 1960–1990 (household income figures are available only for the years 1967–1990). The income measure used is total money income (all cash income, including public assistance, Social Security benefits, and other government transfers). All dollar figures are converted to 1990 levels, using the Consumer Price Index for urban residents (CPI-U).[73] Similar trends are exhibited by both the family income and household income data. The discussion will focus on family income for expository simplicity.[74]

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[70] See, for instance, Frank Levy and Richard Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature* (forthcoming); David Cutler and Lawrence Katz, "Macroeconomic Performance and the Disadvantaged," unpublished paper (September 1991); Barry Bluestone and Bennett Harrison, "The Growth of Low-Wage Employment: 1963-1986," *American Economic Review*, (May 1988); Eugene Kroch, "In Brief: Recent Real Income and Wage Trends in the United States", *Federal Reserve Bank of New York Quarterly Review*, Summer 1991, and the references therein.

[71] A similar trend appears in per capita real GDP growth.

[72] Some observers believe that the effects of the tax system on labor and savings activities is relatively small, while others view these effects as large and having a substantial impact on the overall pre-tax income distribution. For the former view, see Henry Aaron and Joseph Pechman (eds.), *How Taxes Affect Economic Behavior*, Brookings Institution, 1981. For the latter view, see Lawrence Lindsey, *The Growth Experiment: How the New Tax Policy is Transforming the U.S. Economy*, Basic Books, 1990.

[73] A different price index, the CPI-U-X1 index is used to convert the income figures to 1990 dollars in Table 7.

[74] Households consist of all residents of a dwelling unit, whether or not related. Families consist of two or more individuals residing together who are related by birth or marriage. Families tend to be relatively stable economic units and have larger incomes than non-family households.

Table 6. Median Family and Household Income, 1960–1990

[In 1990 CPI-U adjusted dollars]

Year	Family income		Household income	
	Median income	Gini coeff.	Median income	Gini coeff.
1960	$24,815	0.364	N/A	N/A
1961	25,069	0.374	N/A	N/A
1962	25,776	0.362	N/A	N/A
1963	26,691	0.362	N/A	N/A
1964	27,696	0.361	N/A	N/A
1965	28,866	0.356	N/A	N/A
1966	30,384	0.349	N/A	N/A
1967	31,043	0.348	$27,952	0.399
1968	32,420	0.348	29,081	0.388
1969	33,594	0.349	29,876	0.391
1970	33,238	0.353	29,421	0.394
1971	33,191	0.355	29,135	0.396
1972	34,757	0.359	30,321	0.401
1973	35,474	0.356	30,944	0.397
1974	34,205	0.355	29,685	0.395
1975	33,328	0.357	28,667	0.397
1976	34,359	0.358	29,140	0.398
1977	34,528	0.363	29,272	0.402
1978	35,361	0.363	30,197	0.402
1979	35,262	0.365	29,634	0.404
1980	33,346	0.365	28,091	0.403
1981	32,190	0.369	27,425	0.406
1982	31,738	0.380	27,320	0.412
1983	32,378	0.382	27,581	0.414
1984	33,251	0.383	28,197	0.415
1985	33,689	0.389	28,688	0.419
1986	35,129	0.392	29,690	0.425
1987	35,632	0.393	29,984	0.426
1988	35,564	0.395	30,079	0.427
1989	36,062	0.401	30,468	0.431
1990	35,353	0.396	29,943	0.428
Annual growth rates of incomes (in percent):				
1960-1965	3.07	.....	N/A	.....
1965-1970	2.86	.....	1.72(1)	.....
1970-1975	0.05	.....	-0.52	.....
1975-1980	0.01	.....	-0.41	.....
1980-1985	0.20	.....	0.42	.....
1985-1990	0.97	.....	0.86	.....

Notes: (1) Annual growth rate for 1967-1970.
N/A—Not available.

Source: Current Population Reports, Department of Commerce, Bureau of the Census, various years.

As shown in Table 6, median family income increased (on average) from 1960 to 1973. However, since 1973 real median family income has been more or less stagnant. In particular, median family income in 1990 is less than its 1973 level (though there has been some real growth since 1982, which approximately offsets the real decline that occurred in the 1980 and 1981-82 recessions).[75] While examination of median family income measures provides a sense of the well-being of a representative family, one should be aware that use of a median may obscure important differences occurring among different types of families. For instance, if elderly families increased their standard of living over time, while other families had no change in living standards, the effect on the median family income might be negligible.

Some observers contend that use of the CPI-U price index presents a misleading picture of changes in economic well-being that occurred over time because prior to 1983, this price index used changes in the asset values of homes to measure homeownership costs. In 1983, a revised method of computing homeownership costs (basically using the cost of renting equivalent housing) was introduced to the CPI-U. This was intended to prevent overstatements of the cost of living that would occur when the prices of new homes and mortgage interest rates increased rapidly (as occurred during the late 1970s). The Bureau of Labor Statistics has created an experimental price index to produce a consistent price series over time, incorporating the post-1983 methodology. This series is termed the CPI-U-X1 price index, and is available only for years after 1966. Table 7 presents data similar to those in Table 6, utilizing the CPI-U-X1 price series. A comparison of the tables shows the annual growth rates for median family and median household income tend to be somewhat higher using the CPI-U-X1 index than using the CPI-U index, though after 1970, the annual growth rates are low by historical standards.

[75] Median household income in 1990 is less (in real terms) than its peak level in 1973.

Table 7.—Median Family and Household Income, 1967–1990

[In 1990 CPI-U-X1 adjusted dollars]

Year	Family income		Household income	
	Median income	Gini Coeff.	Median Income	Gini Coeff.
1967	$28,563	0.348	$25,719	0.399
1968	29,926	0.348	26,844	0.388
1969	31,292	0.349	27,828	0.391
1970	31,226	0.353	27,640	0.394
1971	31,189	0.355	27,377	0.396
1972	32,722	0.359	28,545	0.401
1973	33,370	0.356	29,108	0.397
1974	32,491	0.355	28,197	0.395
1975	31,905	0.357	27,442	0.397
1976	32,913	0.358	27,913	0.398
1977	33,107	0.363	28,067	0.402
1978	34,156	0.363	29,168	0.402
1979	34,595	0.365	29,074	0.404
1980	33,386	0.365	28,125	0.403
1981	32,476	0.369	27,669	0.406
1982	32,037	0.380	27,577	0.412
1983	32,378	0.382	27,581	0.414
1984	33,251	0.383	28,197	0.415
1985	33,689	0.389	28,688	0.419
1986	35,129	0.392	29,690	0.425
1987	35,632	0.393	29,984	0.426
1988	35,565	0.395	30,079	0.427
1989	36,062	0.401	30,468	0.431
1990	35,353	0.396	29,943	0.428
Annual growth rates (in percent):				
1967–1970	3.02	.....	2.43	.....
1970–1975	0.43	.....	−0.14	.....
1975–1980	0.91	.....	0.49	.....
1980–1985	0.18	.....	0.40	.....
1985–1990	0.97	.....	0.86	.....

Source: Current Population Reports, Department of Commerce, Bureau of the Census, various years.

Measures of dispersion indicate growing income inequality over the 1960–1990 period, with much of the increase in inequality attributable to the years 1980–1990. The Gini coefficient is a standard statistical measure of income inequality used by economists to summarize the characteristics of an income distribution in a single number. This measure equals 1.0 when all income in an economy is attributable to a single economic unit, and 0.0 when all income is equally distributed among the economic units in the economy. Therefore, smaller values of the Gini coefficient are associated with a more equal distribution of income.[76] Tables 6 and 7 present the Gini coefficients for both family and household incomes. The coefficient for family incomes first declined from .364 in 1960 to .348 in 1968, and then increased to .396 in 1990 (the same pattern characterizes the Gini coefficient for household income, though the data are limited to years after 1967). The Gini coefficients in Tables 6 and 7 are identical since this measure is based on the current (not constant) dollar income distribution. These data indicate that the pre-tax income distribution became more unequal over the period examined, with a large part of the increase in inequality occurring in the 1980s. Alternative measures of income inequality are consistent with this finding (see Levy and Marnane, "U.S. Earnings Levels and Earnings Inequality").

Examination of weekly earnings data indicates that, like family income, there has been little real growth over time. Table 8 presents information on weekly earnings and its component parts—hourly wages and weekly hours worked—with all dollar amounts measured in constant 1990 dollars. Real weekly earnings grew (in a more or less steady fashion) from 1960 to 1973, after which a significant decline took place. In 1990, weekly earnings (in constant dollar terms) were at approximately the same level as in 1960. This pattern reflects growth in real wages over the 1960–1973 period, followed by a decline over the 1973–1990 period, combined with a steady drop in the average number of hours worked on a weekly basis. There has been some debate among economists as to whether the decline in observed wages has been accompanied by an increase in other types of non-wage compensation (e.g., fringe benefits, including health insurance). However, there has been little serious questioning that a decline in the *growth rate* of total compensation has taken place over the past two decades.[77]

As shown in Figure 9 of Part II, real per capita GDP grew over the 1969–1988 period, in contrast to falling average weekly earnings. Part of this disparity can be explained by the growth of labor force participation from 61 percent to 67 percent over these 20 years. This reflects the large influx of women into the paid labor force, increasing the number of jobs relative to population. While the overall compensation per employee remained relatively con-

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[76] The subtle properties of the Gini coefficient are the subject of some discussion in the economics profession. One example is Marcus Berliant and Robert Strauss, "Horizontal and Vertical Equity: A Theoretical Framework and Empirical Results for the Federal Individual Income Tax 1966–1987", Rochester Center for Economic Research, August 1991. Another example is Amartya Sen, *On Income Inequality*, (Oxford: Clarendon Press), 1973. However, for the purposes at hand, using the Gini coefficient as a summary statistic is both convenient and useful.

[77] A good discussion of the slow rate of growth in both wages and total compensation is contained in Kroch, "In Brief: Recent Real Income and Wage Trends in the United States".

stant in real terms, the number of jobs increased, resulting in a higher real per capita GNP.

Table 8.—Average Weekly Earnings (and Components), 1960–1990

[In 1990 CPI-U adjusted dollars]

Year	Average weekly earnings (1990 dollars)	Average hourly wage (1990 dollars)	Average weekly hours
1960	$354.75	$9.20	38.6
1961	359.72	9.32	38.6
1962	370.56	9.58	38.7
1963	376.77	9.71	38.8
1964	384.15	9.93	38.7
1965	395.35	10.19	38.8
1966	398.34	10.32	38.6
1967	397.50	10.46	38.0
1968	404.18	10.69	37.8
1969	407.42	10.81	37.7
1970	403.72	10.88	37.1
1971	410.55	11.12	36.9
1972	427.23	11.55	37.0
1973	427.15	11.58	36.9
1974	409.40	11.21	36.5
1975	396.92	11.00	36.1
1976	402.76	11.16	36.1
1977	407.62	11.32	36.0
1978	407.53	11.38	35.8
1979	395.03	11.07	35.7
1980	371.99	10.54	35.3
1981	366.54	10.42	35.2
1982	361.98	10.40	34.8
1983	369.10	10.55	35.0
1984	372.10	10.56	35.2
1985	367.26	10.52	34.9
1986	368.32	10.58	34.8
1987	364.55	10.47	34.8
1988	361.34	10.42	34.7
1989	357.86	10.35	34.6
1990	352.12	10.21	34.5

Source: *Economic Report of the President*, February 1991, table B-44.

Effect of the Federal tax system

Economists generally agree that the Federal tax system is progressive. That is, the Federal tax system imposes a higher burden (measured by the percentage of pre-tax income paid in taxes) on higher-income households than on lower-income households. A more focused consensus is difficult to achieve, since different analysts utilize different measures of income and different measures of taxes paid. For example, assumptions about how the burden of the corporate income tax is distributed among corporate shareholders, all capital owners, consumers, or workers, will determine whether this particular Federal tax is progressive or regressive.[78] A review of the literature indicates that separate analyses generally come to similar conclusions regarding the progressivity of the Federal tax system, though they may use somewhat different methodologies.

As part of the legislative process, the Joint Committee on Taxation produced a table showing effective tax rates before and after enactment of many of the revenue provisions of the Omnibus Budget Reconciliation Act of 1990 ("OBRA 1990"). A portion of this table is reproduced below in Table 9.

[78] A similar situation arises with the Social Security payroll tax. Whether it is assumed to be a tax on current wages used to pay benefits to current retirees or whether it is assumed to be a contribution toward a future pension will affect the overall measure of progressivity of the Federal tax system. In the former case, the payroll tax imposes a regressive tax burden on workers, which will be quite significant if both the employer's and employee's share of the tax are assumed to fall on the worker. In the latter case, the burden is less regressive (and may even be progressive over part of the income distribution), since each worker is being "taxed" only to the extent the contributions are not funding an actuarially fair pension benefit.

Table 9.—Effective Tax Rates Before and After the Omnibus Budget Reconciliation Act of 1990 [1]

[1990 income levels, in percent]

Income category [2]	Effective tax rates	
	Pre-1991 law	Post-OBRA 1990 law
Less than $10,000	13.3	13.1
$10,000 to $20,000	15.6	15.1
$20,000 to $30,000	18.4	18.8
$30,000 to $40,000	20.0	20.4
$40,000 to $50,000	21.4	21.9
$50,000 to $75,000	24.7	25.1
$75,000 to $100,000	25.8	26.4
$100,000 to $200,000	26.2	26.8
$200,000 and over	25.2	26.8
Total, all taxpayers	21.8	22.3

Source: Joint Committee on Taxation, JCX-49-90, October 26, 1990.

Notes: (1) This analysis includes effects from the OBRA 1990 with respect to beer, wine, distilled spirits, tobacco, motor fuels, and telephone excise taxes, increase in the wage cap for the HI portion of the payroll tax, increased individual and alternative minimum tax (AMT) rates, phaseout of personal exemptions, limitation on itemized deductions, individual AMT component of oil and gas production incentives, and the increase and modification of the earned income tax credit. The analysis does not take into account effects from changes in taxpayer behavior.

(2) The income concept used to place tax returns into income categories is adjusted gross income (AGI) plus: [1] tax-exempt interest, [2] employer contributions for health plans and life insurance, [3] inside buildup on life insurance, [4] workers' compensation, [5] nontaxable social security benefits, [6] deductible contributions to individual retirement accounts, [7] the minimum tax preferences, and [8] net losses in excess of minimum tax preferences from passive business activities.

(3) This analysis represents the combined effects of individual income taxes, payroll taxes, Federal excise taxes, and estate and gift taxes. The full burden of payroll taxes is assigned to employees. Excise taxes are assumed to be borne fully by individuals either directly through purchase of the taxed commodity or indirectly through higher prices on all commodities as businesses pass along these added costs. Because of the uncertainty concerning the incidence of the corporate income tax, it is excluded from this table. This table excludes individuals who are dependents of other taxpayers.

As shown in Table 9, the effective tax rates (taxes paid as a percentage of pre-tax income) under the Federal tax system range from 13.1 percent for taxpaying units with incomes under $10,000 to 26.8 percent for taxpaying units with income over $200,000.[79] The picture emerging from this table is that of a tax system where effective tax rates rise more rapidly over the $10,000 to $50,000 range of incomes than over the range $50,000 to $200,000 and above. On the whole, the tax system could be characterized as mildly progressive.[80]

In recent Congressional Budget Office studies, the changes in effective Federal tax burdens over the past 15 years have been examined.[81] The overall findings are that (1) similar to the effective tax rates shown in Table 9, the Federal tax system is somewhat progressive; and (2) over the period examined (generally, the period since 1977), the Federal tax system has become slightly less progressive. To illustrate the first point, Table 10 shows the level of effective Federal tax rates for the years 1977, 1984, and 1988 under two different assumptions regarding the burden of the corporate income tax. These figures indicate that households with the highest incomes (households with incomes over $69,000 in 1988 comprise the tenth decile) experience a higher effective tax rate than those with lower incomes.[82] The size of this difference is sensitive to the assumption regarding the burden of the corporate income tax. As indicated by Table 10, the main areas where changes in progressivity occur over time are at the extremes of the income distribution. Those with the highest incomes have generally seen their effective tax rates drop over the 1977–1988 period while those in the lowest income class have experienced an increase in their effective tax rates, on average.

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[79] Note that the Joint Committee on Taxation measure of income consists of adjusted gross income (reported on the tax return) plus certain categories of economic income. This measure of income is intended to provide a reasonable estimate of the economic income available to a taxpaying unit before consideration of the tax system and many transfer programs (social security benefits, though, are included in income).

[80] Note that the Joint Committee on Taxation does not distribute the effects of the corporate income tax, nor certain other provisions where there is no consensus on how much of the tax is borne by particular taxpayers.

[81] The basic analysis is contained in *The Changing Distribution of Federal Taxes: 1975-1990*, October 1987. This analysis has been updated and referred to in Congressional testimony provided by the Congressional Budget Office. A recent example is the statement of Robert Reischauer, Director of the Congressional Budget Office, before the Senate Finance Committee on November 26, 1991.

[82] The measure of income utilized by CBO in this study is somewhat broader than the measures used by the Joint Committee on Taxation and the Bureau of the Census (for instance, the CBO approach attributes income from the corporate sector to individuals). This means that the same family would have a larger income as measured in the CBO study than in the other studies.

Table 10.—Effective Tax Rates by Income Decile, Selected Years 1977-1988, Under Two Assumptions Regarding the Allocation of the Corporate Income Tax

Decile[1]	Corporate income tax allocated to capital income (effective Federal tax rate (%))	Corporate income tax allocated to labor income (effective Federal tax rate (%))
1977		
First [2]	8.3	8.0
Second	9.1	8.7
Third	12.3	12.0
Fourth	16.1	16.2
Fifth	18.2	19.1
Sixth	19.6	21.0
Seventh	20.9	23.0
Eighth	21.7	23.6
Ninth	22.6	24.5
Tenth	29.5	26.7
Top 5 percent	32.5	27.5
Top 1 percent	39.2	30.9
All deciles[3]	22.8	22.8
1984		
First[2]	10.3	10.5
Second	8.7	8.5
Third	13.4	13.2
Fourth	16.1	16.3
Fifth	18.0	18.5
Sixth	19.6	20.1
Seventh	20.7	21.5
Eighth	22.0	23.0
Ninth	22.8	23.8
Tenth	24.8	23.6
Top 5 percent	25.4	23.3
Top 1 percent	26.9	23.1
All deciles[3]	21.7	21.7
1988		
First[2]	9.7	9.6
Second	8.6	8.3
Third	13.3	13.3
Fourth	16.5	16.8
Fifth	18.5	19.2
Sixth	20.2	20.9
Seventh	21.4	22.3
Eighth	22.3	23.6
Ninth	23.4	24.7
Tenth	26.6	25.0
Top 5 percent	27.4	24.9
Top 1 percent	29.3	24.9
All deciles[3]	22.7	22.7

[1] Ranked by size of family income.
[2] Excludes families with zero or negative incomes.
[3] Includes families with zero or negative income not shown separately.

Source: Congressional Budget Office, *The Changing Distribution of Federal Taxes 1975-1990*, October 1987.

It should be noted that the measure of effective tax burdens is not the same as the proportion of the aggregate tax revenues paid by various taxpayers. In particular, the tax liability for taxpayers in the highest income classes as a percentage of overall tax payments has increased over time. However, this increase has not been as large as the pre-tax income increase for these taxpayers. Therefore, the effective tax burdens for higher income households have remained approximately constant (and have declined, in some cases) over time (the actual result depends on the time period analyzed).[83]

A slightly different time period was examined by Joseph Pechman in *Who Paid the Taxes, 1966-1985?*[84] Using a wide variety of assumptions regarding the incidence of different taxes, Pechman found that the nation's tax system (including State and local taxes as well as Federal taxes) became less progressive over the period 1966-1985. Under assumptions that provided the most progressive estimate of the Federal tax system (e.g., half the burden of the corporate income tax placed on shareholders and half to all property owners), Pechman characterized the Federal tax system as, on the whole, progressive. However, incidence assumptions that resulted in the least progressive characterization of the Federal tax system (e.g., the burden of the corporate income tax being placed half on consumers and half on property owners), indicated that the Federal tax system went from being slightly regressive in 1966 to being even more regressive in 1985.[85]

Post-tax income distribution

When the observations regarding the pre-tax income distribution and the role of the tax system are combined, one sees that the tax system has only modest effects on reversing the trend toward growing income inequality. This is summarized in a recent publication by the Majority Staff of the House Committee on Ways and Means.[86] Table 11 lists pre-tax and post-tax incomes for 1979 and 1989 in terms of multiples of the poverty threshold. Pre-tax income became more unequal over this period, with the lowest income households suffering a decline in real income, while the highest income households had a substantial increase in real income.[87] Table 11 indicates that the tax system historically has a small

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[83] If 1980 is used as the base year (instead of 1977) the decline in progressivity is smaller than that reported in Table 10. However, while the magnitudes change a bit, the qualitative conclusions are similar. The tax changes incorporated in OBRA 1990 presumably have reduced the average Federal tax burden on lower-income households, increasing the progressivity of the Federal tax system.

[84] Joseph Pechman, *Who Paid the Taxes, 1966-1985?*, Brookings Institution, 1985.

[85] Pechman noted that Federal transfer programs were significantly progressive and would be expected to increase the progressivity of the overall Federal tax and transfer system. In fact, Pechman claimed that the existence and size of transfer payments (Social Security, Medicare, Medicaid, food stamps, etc.) over the period were responsible for keeping the overall pre-tax income distribution in the United States relatively constant over the period studied. As noted above, market incomes over this period became more unequally distributed.

[86] Ways and Means Committee, U.S. Congress, *Overview of Entitlement Programs*, May 1991 (commonly referred to as the "1991 Green Book").

[87] In Table 11, households are ranked according to their income as a multiple of poverty threshold (in order to account for the affect of family size on the living standards of the family). The table separates households into income quintiles (fifths of the population), so the highest quintile is the fifth of the household population with the highest income as adjusted for family size.

impact, at best, in moderating income inequality. This finding is consistent with those of other studies.

Table 11.—Pre-Tax and Post-Tax Incomes as Multiples of the Poverty Threshold by Income Quintiles, 1979 and 1989

Families ranked by pre-tax income	1979		1989	
	Pre-tax income	Post-tax income	Pre-tax income	Post-tax income
Lowest quintile	0.92	0.96	0.87	0.93
Second quintile	2.09	1.89	2.10	1.90
Middle quintile	3.09	2.67	3.28	2.84
Fourth quintile	4.31	3.63	4.75	4.01
Highest quintile	7.36	5.85	8.80	7.04
Average	3.55	3.00	3.96	3.35

Source: Ways and Means Committee, U.S. Congress, *Overview of Entitlement Programs* ("1991 Green Book"), pp. 1201 and 1210.

As discussed above, the role of the payroll tax is important in determining the degree of overall progressivity of the Federal tax system. Economists generally agree that the burden of a payroll tax (both the employee's and the employer's share) used to fund transfers to current retirees is borne mainly (if not entirely) by workers. This means that wage earners bear up to a 15.3-percent tax on their earnings (unless earnings are greater than the maximum wage base—$53,400 in 1991 for the OASDI portion of the payroll tax), which is often larger in absolute terms than the burden of the individual income tax.[88] If, on the other hand, the payroll tax is considered to be a contribution for future pension benefits, then the burden of the payroll tax is much smaller (and perhaps negative for some workers), since it equals only the difference between the current contributions to Social Security (both the employee and employer share) and the expected present value of the Social Security benefits attributable to the contribution. Under this characterization of Social Security, the payroll tax is much less regressive (and may be characterized as progressive with respect to low-wage workers), in light of the larger relative Social Security benefits paid to lower-income individuals.

Designing redistribution policies

The choice of policy goals is important in determining whether and how redistribution should take place. An obvious example is the choice between tax-based policies and direct spending programs. For example, direct spending programs may be an effective means to promote both growth and redistribution. In particular, spending on education may help in the formation of marketable skills (called human capital by economists) that may provide long-

[88] For self-employed workers, the tax burden may be different, since these workers are able to claim an income tax deduction for one-half of their payroll tax liability. This corresponds to a deduction for the employer portion of the payroll tax.

term economic growth (and growth in family income) and help reduce income inequality (to the extent that the educational benefits are not skewed toward higher-income households).[89] Alternatively, tax policies could be developed to provide similar amounts of subsidy for human capital formation and/or redistribution. As mentioned above, though, tax incentives may not be targeted as precisely as direct spending programs and may achieve one of the goals (e.g., either promoting economic growth or redistribution) only at the expense of the other.

Targeting tax relief

If policy makers determine that some redistribution through the tax system is desirable, the appropriate amount and the targeting of the redistribution both become an issue. For instance, middle-income tax relief is one potential goal. In order to accomplish this goal, it is important to define the middle-income group at which the tax relief is to be directed. In an earlier section, median family income was shown to be $35,353 in 1990. Families with money income over $90,000 are in the top 5 percent of the pre-tax income distribution (it should be noted that there is some difference in incomes of families depending on the age of the family head and the composition of the family). These facts are important to keep in mind when determining which income groups (if any) are to receive targeted tax relief. Once the definition of middle-income taxpayers is settled upon, the appropriate amount of tax relief can be targeted to these individuals through either rate changes, tax credits, or increased deductions.

It is important to distinguish between the levels of income in the economy and the distribution of that income among members of the economy. Economists generally agree that a policy that increases the income of all members of an economy, with no individual suffering a decrease in income, would be desirable. However, if a policy causes increases in the income of some members of the economy that are accompanied by decreases in the incomes of others, then there is no consensus among economists on whether such a change is desirable. This necessarily introduces an element of subjective judgment into the debate over whether particular policies provide an appropriate amount of redistribution.

Another issue to be addressed is how universal any redistributional policies will attempt to be. For instance, certain proposals seek to provide relief to taxpayers with dependent children, either through a tax credit or an enhanced personal exemption. These proposals affect perhaps only one-third of the total number of taxpayers. Whether these households are most in need of tax relief (through a reduction in income taxes) requires a subjective assessment for which economists are not uniquely qualified.

Tax credits versus deductions

In general, tax credits are a more progressive means of providing tax relief than are subsidies provided through tax deductions. This

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[89] For additional discussion on education and human capital formation, see Joint Committee on Taxation, *Factors Affecting the International Competitiveness of the United States* (JCS-6-91), May 30, 1991.

is because a tax credit provides the same dollar benefit to all taxpayers who take advantage of the provision while the value of a tax deduction is larger for taxpayers with higher marginal tax rates (generally those with higher incomes). For the same total revenue cost, a tax credit targets more tax relief toward lower-income households.

If tax credits are chosen as the policy tool to provide targeted income tax relief, the issue of refundability presents itself. A refundable tax credit provides additional relief to households that do not owe any current income tax liability. These are generally households with low current incomes. Therefore, a refundable credit provides a benefit to households with the lowest incomes. However, this targeting comes at an administrative cost. Taxpayers with no income tax liability may be exempt from the requirement to file an income tax return. In fact, one of the accomplishments of the Tax Reform Act of 1986 was the elimination of filing requirements for several million households. A widely available refundable tax credit would likely bring these (and other) taxpayers back onto the income tax rolls. This would impose a compliance cost on those taxpayers who are brought into the income tax system as well as impose a cost on the Internal Revenue Service, which would be responsible for administering such a proposal.

If a proposal is intended to provide redistribution through the tax system on a long-term basis, it may be desirable to index key parameters of the proposal for inflation. In this way, the redistributional benefits provided by the proposal will be maintained in future years, despite changes in the price level. Current law indexes a number of elements of the individual income tax system (e.g., tax bracket thresholds, personal exemption and standard deduction amounts, the maximum amount of earned income tax credit, etc.) for inflation. Proposals that simply alter the amounts of items which are already indexed will automatically be adjusted for future inflation. However, proposals which create a new deduction or credit will need to address the issue of indexation.

Summary of redistributional issues

In designing tax policies intended to redistribute resources from one group of taxpayers to another, decisions have to be made regarding who is to be targeted as benefitting from (and paying for) the redistribution. These decisions require essentially subjective assessments of fairness, and economists may not be well-positioned to make these assessments. Other issues, though, may lend themselves to useful economic analysis. In determining whether redistribution should be done via deductions or credits, whether the policies should provide for refundable benefits, and whether the key parameters of the proposal should be indexed, some general economic observations can guide policymakers. In making these decisions, administrative concerns often will need to be addressed. One particular concern is the potential introduction of many additional taxpayers into the tax system, if only to receive a refund. The cost of taking this step needs to be weighed against the benefits that would be achieved.

A careful comparison of the costs and benefits of any redistributive policy is warranted. The benefits provided to specifically tar-

geted classes of taxpayers should be compared to the costs (if any) imposed on taxpayers whose tax burdens are increased. In particular, as noted in Part V, income taxes may discourage labor and savings activity by the affected taxpayers. If redistributive policies take the form of reduced taxes on some taxpayers financed by tax increases on other taxpayers, part of the costs of this policy will be the possible reduced economic activity on the part of the more highly taxed parties. Such a policy should be adopted only where the benefits are sufficiently large to outweigh the costs.

APPENDIX: ADDITIONAL ECONOMIC DATA TABLES

This Appendix contains the economic data supporting Figures 1, 2, 4, 5, 6, 7, 8, 9, 10, and 11 in the text of the pamphlet.

Appendix Table 1.—Real GNP and Full Employment GNP in 1982 Dollars, Quarterly, 1970–1991

[In millions of dollars]

Years [1]	Real GNP	Real full employment GNP
1970	2,408.6	2,370.7
—2	2,406.5	2,390.7
—3	2,435.8	2,410.9
—4	2,413.8	2,431.4
1971	2,478.6	2,452.1
—2	2,478.4	2,472.9
—3	2,491.1	2,493.7
—4	2,491.0	2,514.8
1972	2,545.6	2,536.2
—2	2,595.1	2,557.7
—3	2,622.1	2,579.4
—4	2,671.3	2,601.3
1973	2,734.0	2,623.3
—2	2,741.0	2,645.5
—3	2,738.3	2,668.2
—4	2,762.8	2,690.6
1974	2,747.4	2,713.5
—2	2,755.2	2,736.4
—3	2,719.3	2,759.9
—4	2,695.4	2,779.9
1975	2,642.7	2,800.2
—2	2,669.6	2,820.6
—3	2,714.9	2,841.1
—4	2,752.7	2,862.0
1976	2,804.4	2,882.7
—2	2,816.9	2,903.7
—3	2,828.6	2,924.9
—4	2,856.8	2,946.4
1977	2,896.0	2,967.7
—2	2,942.7	2,989.4
—3	3,001.8	3,011.2
—4	2,994.1	3,033.1
1978	3,020.5	3,055.4
—2	3,115.9	3,077.5

Appendix Table 1.—Real GNP and Full Employment GNP in 1982 Dollars, Quarterly, 1970–1991—Continued

[In millions of dollars]

Years [1]	Real GNP	Real full employment GNP
—3	3,142.6	3,100.0
—4	3,181.6	3,122.6
1979	3,181.7	3,145.3
—2	3,178.7	3,168.3
—3	3,207.4	3,191.4
—4	3,201.3	3,214.7
1980	3,233.4	3,238.1
—2	3,157.0	3,261.7
—3	3,159.1	3,285.5
—4	3,199.2	3,309.6
1981	3,261.1	3,330.6
—2	3,250.2	3,349.4
—3	3,264.6	3,372.3
—4	3,219.0	3,391.6
1982	3,170.4	3,411.1
—2	3,179.9	3,430.7
—3	3,154.5	3,450.4
—4	3,159.3	3,470.2
1983	3,186.6	3,490.2
—2	3,258.3	3,510.2
—3	3,306.4	3,530.4
—4	3,365.1	3,550.6
1984	3,451.7	3,571.0
—2	3,498.0	3,591.5
—3	3,520.6	3,612.1
—4	3,535.2	3,632.9
1985	3,577.2	3,653.7
—2	3,599.2	3,674.7
—3	3,635.8	3,695.8
—4	3,662.4	3,717.1
1986	3,721.1	3,738.4
—2	3,704.6	3,759.9
—3	3,712.4	3,781.5
—4	3,733.6	3,803.2
1987	3,781.2	3,825.0
—2	3,820.3	3,847.0
—3	3,858.9	3,869.1
—4	3,920.7	3,891.3
1988	3,970.2	3,913.6
—2	4,005.8	3,936.1
—3	4,032.1	3,958.7
—4	4,059.3	3,981.4
1989	4,095.7	4,004.3
—2	4,112.2	4,027.3
—3	4,129.7	4,050.4

Appendix Table 1.—Real GNP and Full Employment GNP in 1982 Dollars, Quarterly, 1970–1991—Continued

[In millions of dollars]

Years [1]	Real GNP	Real full employment GNP
—4	4,133.2	4,073.7
1990	4,150.6	4,097.1
—2	4,155.1	4,120.6
—3	4,170.0	4,144.3
—4	4,153.4	4,168.1
1991	4,124.1	4,191.9
—2	4,118.9	4,212.8

[1] Quarterly observations. The first entry for each year is the first quarter.
Source: Department of Commerce.

Appendix Table 2.—Unemployment Rate and Capacity Utilization Rate, Quarterly, 1948–1991

[In percent]

Year [1]	Unemployment rate	Capacity utilization
1948	3.7	83.9
—2	3.7	83.2
—3	3.8	82.5
—4	3.8	80.4
1949	4.7	76.9
—2	5.9	73.5
—3	6.7	73.8
—4	7.0	72.4
1950	6.4	75.6
—2	5.6	81.1
—3	4.6	87.0
—4	4.2	87.5
1951	3.5	88.3
—2	3.1	87.4
—3	3.2	84.1
—4	3.4	83.5
1952	3.1	84.6
—2	3.0	82.9
—3	3.2	84.2
—4	2.8	89.8
1953	2.7	91.0
—2	2.6	91.3
—3	2.7	90.0
—4	3.7	84.7
1954	5.3	80.8
—2	5.8	79.7
—3	6.0	79.1
—4	5.3	80.8
1955	4.7	84.5
—2	4.4	87.4
—3	4.1	87.5
—4	4.2	88.6
1956	4.0	87.5
—2	4.2	86.5
—3	4.1	84.1
—4	4.1	86.4
1957	3.9	86.5
—2	4.1	84.6
—3	4.2	83.9
—4	4.9	79.4
1958	6.3	74.1
—2	7.4	72.4
—3	7.3	75.4
—4	6.4	78.2
1959	5.8	81.4
—2	5.1	84.6

Appendix Table 2.—Unemployment Rate and Capacity Utilization Rate, Quarterly, 1948–1991—Continued

[In percent]

Year [1]	Unemployment rate	Capacity utilization
—3	5.3	80.5
—4	5.6	80.1
1960	5.1	84.5
—2	5.2	81.3
—3	5.5	78.9
—4	6.3	75.9
1961	6.8	73.8
—2	7.0	76.4
—3	6.8	78.4
—4	6.2	80.7
1962	5.6	81.2
—2	5.5	81.3
—3	5.6	81.6
—4	5.5	81.6
1963	5.8	82.3
—2	5.7	83.8
—3	5.5	83.5
—4	5.6	84.2
1964	5.5	84.5
—2	5.2	85.5
—3	5.0	86.1
—4	5.0	86.5
1965	4.9	88.9
—2	4.7	89.4
—3	4.4	89.9
—4	4.1	90.0
1966	3.9	91.1
—2	3.8	91.5
—3	3.8	91.2
—4	3.7	90.6
1967	3.8	88.6
—2	3.8	86.8
—3	3.8	86.0
—4	3.9	87.4
1968	3.7	87.4
—2	3.6	87.4
—3	3.5	86.8
—4	3.4	87.2
1969	3.4	87.8
—2	3.4	87.1
—3	3.6	87.0
—4	3.6	85.3
1970	4.2	82.0
—2	4.8	80.7
—3	5.2	79.4
—4	5.8	76.6

Appendix Table 2.—Unemployment Rate and Capacity Utilization Rate, Quarterly, 1948–1991—Continued

[In percent]

Year [1]	Unemployment rate	Capacity utilization
1971	5.9	77.8
—2	5.9	77.9
—3	6.0	77.7
—4	5.9	79.4
1972	5.8	81.9
—2	5.7	83.2
—3	5.6	83.6
—4	5.4	86.2
1973	4.9	87.6
—2	4.9	88.0
—3	4.8	88.5
—4	4.8	88.2
1974	5.1	85.3
—2	5.2	85.1
—3	5.6	84.5
—4	6.6	80.2
1975	8.3	72.5
—2	8.9	71.5
—3	8.5	73.5
—4	8.3	75.3
1976	7.7	77.3
—2	7.6	78.0
—3	7.7	78.7
—4	7.8	79.8
1977	7.5	81.3
—2	7.1	83.1
—3	6.9	83.5
—4	6.7	83.4
1978	6.3	82.9
—2	6.0	85.0
—3	6.0	85.6
—4	5.9	86.8
1979	5.9	86.8
—2	5.7	85.9
—3	5.9	84.8
—4	6.0	84.2
1980	6.3	83.8
—2	7.3	79.2
—3	7.7	77.8
—4	7.4	80.1
1981	7.4	79.9
—2	7.4	79.6
—3	7.4	79.2
—4	8.2	76.3
1982	8.8	74.7
—2	9.4	73.7

Appendix Table 2.—Unemployment Rate and Capacity Utilization Rate, Quarterly, 1948–1991—Continued

[In percent]

Year [1]	Unemployment rate	Capacity utilization
—3	9.9	72.3
—4	10.7	70.5
1983	10.4	71.8
—2	10.1	73.7
—3	9.4	76.2
—4	8.5	78.0
1984	7.9	79.9
—2	7.4	80.6
—3	7.4	80.9
—4	7.3	80.2
1985	7.2	79.7
—2	7.3	80.0
—3	7.2	79.4
—4	7.0	79.1
1986	7.0	79.3
—2	7.2	78.7
—3	7.0	78.7
—4	6.8	79.4
1987	6.6	80.0
—2	6.3	81.0
—3	6.0	82.0
—4	5.8	82.8
1988	5.7	83.1
—2	5.5	83.7
—3	5.5	84.3
—4	5.3	84.6
1989	5.2	84.7
—2	5.3	84.6
—3	5.3	83.7
—4	5.3	82.9
1990	5.3	82.7
—2	5.3	82.8
—3	5.6	82.9
—4	5.9	80.8
1991	6.5	78.0
—2	6.8	77.9
—3	6.8	78.7

[1] Quarterly observations. The first entry for each year is the first quarter.

Source: Department of Labor, Bureau of Labor Statistics, and Federal Reserve.

Appendix Table 3.—Inflation Rate as Measured by Changes in the Consumer Price Index, Quarterly, 1968–1991

[In percent]

Years [1]	Inflation
1968	4.82
—2	3.96
—3	5.52
—4	4.65
1969	4.99
—2	6.87
—3	5.99
—4	5.90
1970	5.44
—2	6.84
—3	4.56
—4	5.57
1971	3.06
—2	4.42
—3	4.37
—4	1.98
1972	2.96
—2	3.27
—3	3.90
—4	3.86
1973	5.13
—2	9.31
—3	9.10
—4	9.54
1974	11.82
—2	11.79
—3	12.65
—4	12.55
1975	7.45
—2	6.24
—3	8.79
—4	6.53
1976	3.92
—2	5.12
—3	6.53
—4	4.73
1977	7.07
—2	9.10
—3	5.87
—4	4.43
1978	7.08
—2	10.56
—3	9.85
—4	8.32
1979	10.26
—2	14.64
—3	13.92
—4	11.87
1980	16.76

Appendix Table 3.—Inflation Rate as Measured by Changes in the Consumer Price Index, Quarterly, 1968–1991—Continued

[In percent]

Years [1]	Inflation
—2	15.53
—3	7.54
—4	10.99
1981	11.03
—2	9.59
—3	11.77
—4	5.90
1982	3.31
—2	6.21
—3	7.72
—4	0.96
1983	—0.27
—2	5.14
—3	4.79
—4	3.64
1984	4.56
—2	4.37
—3	4.46
—4	2.97
1985	2.56
—2	5.00
—3	2.89
—4	3.63
1986	0.86
—2	—0.85
—3	2.97
—4	2.20
1987	4.54
—2	5.36
—3	4.68
—4	3.42
1988	2.45
—2	5.15
—3	5.44
—4	4.21
1989	4.51
—2	6.74
—3	3.27
—4	3.91
1990	7.07
—2	4.12
—3	7.09
—4	6.65
1991	3.33
—2	2.40
—3	3.18

[1] Quarterly observations. The first entry for each year is the first quarter.

Source: Department of Labor, Bureau of Labor Statistics.

Appendix Table 4.—Nominal and Real Interest Rates, Quarterly, 1954–1991

[In percent]

Years [1]	Nominal interest [2]	Real interest [3]
1954	1.06	1.55
—2	0.79	0.79
—3	0.88	2.36
—4	1.02	2.01
1955	1.23	1.23
—2	1.48	—0.53
—3	1.86	1.36
—4	2.34	3.33
1956	2.33	—1.20
—2	2.57	—2.46
—3	2.58	0.12
—4	3.03	0.59
1957	3.10	—1.30
—2	3.14	—1.22
—3	3.35	2.41
—4	3.30	—0.99
1958	1.76	—1.54
—2	0.96	0.49
—3	1.68	1.68
—4	2.69	2.69
1959	2.77	1.38
—2	3.00	0.22
—3	3.54	1.24
—4	4.23	4.68
1960	3.87	1.58
—2	2.99	2.09
—3	2.36	—0.37
—4	2.31	2.31
1961	2.35	2.35
—2	2.30	0.05
—3	2.30	1.86
—4	2.46	1.57
1962	2.72	0.94
—2	2.71	0.94
—3	2.84	1.96
—4	2.81	2.37
1963	2.91	1.59
—2	2.94	0.74
—3	3.29	1.54
—4	3.50	2.63
1964	3.53	3.10
—2	3.48	1.74
—3	3.50	2.20
—4	3.68	2.82
1965	3.89	0.87
—2	3.87	2.17

Appendix Table 4.—Nominal and Real Interest Rates, Quarterly, 1954–1991—Continued

[In percent]

Years [1]	Nominal interest [2]	Real interest [3]
—3	3.86	2.16
—4	4.16	1.18
1966	4.60	—0.06
—2	4.58	0.82
—3	5.03	1.72
—4	5.20	4.79
1967	4.51	1.23
—2	3.66	—0.01
—3	4.29	0.66
—4	4.74	—0.08
1968	5.04	1.08
—2	5.51	0.00
—3	5.20	0.55
—4	5.58	0.59
1969	6.09	—0.78
—2	6.19	0.20
—3	7.01	1.11
—4	7.35	1.91
1970	7.21	0.37
—2	6.67	2.1
—3	6.33	0.75
—4	5.35	2.29
1971	3.84	—0.58
—2	4.24	—0.13
—3	5.00	3.03
—4	4.23	1.27
1972	3.44	0.17
—2	3.77	—0.13
—3	4.22	0.36
—4	4.86	—0.26
1973	5.70	—3.61
—2	6.60	—2.50
—3	8.32	—1.21
—4	7.50	—4.32
1974	7.62	—4.17
—2	8.15	—4.49
—3	8.19	—4.36
—4	7.36	—0.09
1975	5.75	—0.49
—2	5.39	—3.40
—3	6.33	—0.20
—4	5.63	1.71
1976	4.92	—0.20
—2	5.16	—1.37
—3	5.15	0.42
—4	4.67	—2.40

Appendix Table 4.—Nominal and Real Interest Rates, Quarterly, 1954–1991—Continued

[In percent]

Years [1]	Nominal interest [2]	Real interest [3]
1977	4.63	−4.47
−2	4.84	−1.03
−3	5.50	1.07
−4	6.11	−0.97
1978	6.39	−4.17
−2	6.48	−3.37
−3	7.31	−1.01
−4	8.57	−1.69
1979	9.38	−5.26
−2	9.38	−4.54
−3	9.67	−2.20
−4	11.84	−4.92
1980	13.35	−2.17
−2	9.62	2.08
−3	9.15	−1.83
−4	13.61	2.58
1981	14.39	4.80
−2	14.91	3.14
−3	15.05	9.15
−4	11.75	8.44
1982	12.81	6.60
−2	12.42	4.70
−3	9.32	8.36
−4	7.91	8.18
1983	8.12	2.97
−2	8.40	3.60
−3	9.14	5.50
−4	8.80	4.24
1984	9.17	4.80
−2	9.80	5.34
−3	10.32	7.35
−4	8.80	6.25
1985	8.18	3.19
−2	7.46	4.57
−3	7.11	3.48
−4	7.17	6.31
1986	6.90	7.75
−2	6.14	3.17
−3	5.52	3.32
−4	5.35	0.81
1987	5.54	0.18
−2	5.66	0.98
−3	6.04	2.62
−4	5.86	3.41
1988	5.72	0.57
−2	6.21	0.77

Appendix Table 4.—Nominal and Real Interest Rates, Quarterly, 1954–1991—Continued

[In percent]

Years [1]	Nominal interest [2]	Real interest [3]
—3	7.01	2.80
—4	7.73	3.22
1989	8.54	1.80
—2	8.41	5.14
—3	7.84	3.94
—4	7.65	0.59
1990	7.76	3.64
—2	7.75	0.66
—3	7.48	0.83
—4	6.99	3.66
1991	6.02	3.63
—2	5.56	2.38

[1] Quarterly observations. The first entry for each year is the first quarter.
[2] Nominal yield on three-month Treasury bills in the secondary market.
[3] The real interest rate reported is the nominal interest rate less the actual inflation rate, as measured by changes in the CPI for the quarter.

Source: Department of Commerce, Survey of Current Business, various issues.

Appendix Table 5.—Index of Consumer Sentiment, Quarterly Average of Monthly Data, 1961-1991

Years [1]	Consumer sentiment [2]
1961	91.6
—2	92.5
—3	99.2
—4	93.0
1962	99.9
—2	95.4
—3	91.6
—4	95.0
1963	98.4
—2	91.7
—3	96.4
—4	94.4
1964	99.5
—2	98.5
—3	100.6
—4	99.9
1965	102.0
—2	102.2
—3	103.4
—4	102.9
1966	100.0
—2	95.7
—3	91.2
—4	88.3
1967	94.1
—2	95.9
—3	97.0
—4	92.9
1968	97.2
—2	92.4
—3	92.4
—4	91.7
1969	98.2
—2	91.5
—3	86.4
—4	79.7
1970	78.1
—2	75.4
—3	77.6
—4	72.4
1971	78.1
—2	80.2
—3	82.1
—4	82.0
1972	92.8
—2	88.6
—3	95.2

Appendix Table 5.—Index of Consumer Sentiment, Quarterly Average of Monthly Data, 1961-1991—Continued

Years [1]	Consumer sentiment [2]
—4	90.7
1973	81.9
—2	77.0
—3	72.0
—4	76.5
1974	61.8
—2	72.1
—3	64.4
—4	59.5
1975	57.6
—2	72.8
—3	75.7
—4	75.6
1976	84.6
—2	83.3
—3	89.7
—4	87.0
1977	87.1
—2	90.2
—3	89.0
—4	84.4
1978	82.3
—2	81.5
—3	80.4
—4	73.5
1979	71.5
—2	66.6
—3	63.9
—4	62.1
1980	63.5
—2	54.4
—3	67.8
—4	72.1
1981	68.3
—2	73.9
—3	74.8
—4	65.7
1982	66.5
—2	66.2
—3	66.7
—4	72.5
1983	75.3
—2	91.5
—3	91.6
—4	91.5
1984	99.5
—2	96.6

Appendix Table 5.—Index of Consumer Sentiment, Quarterly Average of Monthly Data, 1961-1991—Continued

Years [1]	Consumer sentiment [2]
—3	98.9
—4	95.0
1985	94.5
—2	94.3
—3	92.8
—4	91.1
1986	95.5
—2	96.8
—3	94.8
—4	92.0
1987	90.5
—2	91.8
—3	93.9
—4	86.4
1988	92.3
—2	93.6
—3	96.0
—4	93.0
1989	95.9
—2	90.9
—3	92.5
—4	91.8
1990	91.3
—2	90.9
—3	79.1
—4	65.1
1991	75.0
—2	80.7
—3	82.6

[1] Quarterly observations. The first entry for each year is the first quarter.

[2] Initiated in 1946, the index is the result of period surveys of consumer attitudes and expectations. The index is benchmarked to a value of 100 in February 1966. The index reported here is composed of five individual indices: current personal finances; expected personal finances; expected business conditions over the next 12 months; expected business conditions over the next five years; and current buying conditions for durable goods.

Source: University of Michigan, Survey Research Center.

Appendix Table 6.—Actual Federal Deficit and Full Employment Deficit as a Percentage of GNP, Quarterly, 1970–1991

[In percent]

Years [1]	Actual deficit	Full employment deficit
1970	—0.054	—0.303
—2	—0.544	—0.686
—3	—0.612	—0.772
—4	—0.845	—0.791
1971	—0.746	—0.863
—2	—0.952	—0.968
—3	—0.955	—0.947
—4	—0.891	—0.779
1972	—0.503	—0.574
—2	—0.794	—0.998
—3	—0.389	—0.591
—4	—0.887	—1.232
1973	—0.322	—0.86
—2	—0.321	—0.788
—3	—0.106	—0.478
—4	—0.065	—0.442
1974	—0.16	—0.364
—2	—0.385	—0.508
—3	—0.291	—0.088
—4	—0.868	—0.371
1975	—0.778	—0.685
—2	—3.75	—2.731
—3	—2.383	—1.466
—4	—2.39	—1.558
1976	—1.918	—1.323
—2	—1.725	—1.983
—3	—1.941	—1.22
—4	—1.988	—1.299
1977	—1.354	—0.767
—2	—1.427	—1.04
—3	—1.729	—1.576
—4	—1.703	—1.386
1978	—1.573	—1.331
—2	—0.812	—1.043
—3	—0.77	—1.002
—4	—0.641	—0.996
1979	—0.308	—0.512
—2	—0.189	—0.271
—3	—0.624	—0.717
—4	—0.897	—0.784
1980	—1.169	—1.095
—2	—2.043	—1.159
—3	—2.374	—1.206
—4	—2.126	—1.125
1981	—1.453	—0.733
—2	—1.514	—0.591

Appendix Table 6.—Actual Federal Deficit and Full Employment Deficit as a Percentage of GNP, Quarterly, 1970–1991—Continued

[In percent]

Years [1]	Actual deficit	Full employment deficit
—3	—1.914	—0.913
—4	—2.982	—1.317
1982	—3.444	—1.072
—2	—3.55	—1.025
—3	—5.034	—2.07
—4	—6.413	—3.2
1983	—5.843	—2.774
—2	—5.26	—2.685
—3	—5.362	—3.161
—4	—5.028	3.278
1984	—4.479	—3.335
—2	—4.671	—3.788
—3	—4.908	—4.011
—4	—5.304	—4.365
1985	—4.517	—3.737
—2	—5.865	—5.104
—3	—5.575	—4.937
—4	—5.794	—5.204
1986	—5.257	—4.972
—2	—6.37	—5.75
—3	—5.571	—4.857
—4	—5.062	—4.371
1987	—5.236	—4.821
—2	—3.437	—3.201
—3	—3.669	—3.587
—4	—4.124	—4.412
1988	—3.871	—4.36
—2	—3.418	—4.042
—3	—2.979	—3.601
—4	—3.85	—4.55
1989	—3.238	—4.07
—2	—2.984	—3.772
—3	—3.189	—3.918
—4	—3.632	—4.181
1990	—4.055	—4.59
—2	—3.995	—4.38
—3	—3.494	—3.779
—4	—4.437	—4.312
1991	—3.077	—2.371
—2	—4.482	—3.535

[1] Quarterly observations. The first entry for each year is the first quarter.

Source: Department of Commerce.

Appendix Table 7.—Average Annual Rates of Growth of Per Capita Real GDP in Selected Countries, 1969–1988

[In percent]

Country	1969–78	1979–88	1969–88
United States	1.79	1.73	1.76
Japan	4.67	3.51	4.09
West Germany	3.11	1.89	2.50
France	3.37	1.56	2.46
United Kingdom	2.15	2.20	2.18
Italy	3.27	2.56	2.91
Canada	3.52	2.31	2.91
Belgium	3.70	1.81	2.75
Greece	5.21	1.10	3.16
Netherlands	2.87	.80	1.83
Sweden	2.10	2.02	2.06
Switzerland	1.34	1.66	1.50
Australia	1.92	1.77	1.85

Source: OECD, *National Accounts, 1960–89*, Volume 1, 1989, and OECD *Labor Force Statistics, 1968–1988*, 1990.

Appendix Table 8.—Net Investment Rates as a Percentage of GDP in Selected Countries, Selected Years, 1962–1989

Country	1962	1967	1972	1975	1978	1981	1982	1983	1984	1985	1986	1987	1988	1989
United States	8.5	9.2	8.9	4.8	9.3	6.3	2.7	3.4	7.0	6.0	5.4	5.3	5.0	4.7
Japan	22.4	22.2	21.6	19.9	18.7	18.0	16.7	14.6	14.6	14.7	14.2	15.0	16.7	18.2
Germany	18.7	12.8	15.6	8.6	10.0	8.8	7.2	7.8	7.9	7.0	7.2	7.2	8.2	9.4
France	15.7	17.7	16.7	12.3	11.6	9.3	9.3	7.2	6.3	6.3	7.2	7.4	8.5	8.9
United Kingdom	8.5	11.3	9.1	7.6	8.0	2.7	3.6	4.6	5.4	5.4	5.2	6.4	8.9	9.3
Italy	19.7	13.9	13.5	11.1	11.9	12.4	10.9	9.2	10.6	10.1	8.6	8.7	9.6	9.9
Canada	10.5	12.5	12.0	14.4	12.1	13.2	7.3	7.8	8.7	8.5	8.7	10.0	11.1	11.5
Belgium	11.5	13.7	12.2	12.6	12.4	8.5	8.1	5.8	6.8	5.3	5.6	6.8	8.5	10.6
Greece	15.9	16.9	23.3	19.9	20.0	16.8	12.7	13.0	10.8	12.6	10.1	8.0	10.0	10.5
Netherlands	16.5	18.5	15.5	11.5	12.9	8.2	7.7	8.1	8.8	9.5	9.5	8.6	9.3	10.5
Sweden	13.8	14.1	11.9	13.6	6.1	6.3	5.5	4.9	5.7	7.4	6.2	7.1	8.0	9.8
Switzerland	21.6	18.0	19.7	12.1	10.9	14.9	13.6	13.7	13.9	14.1	16.0	17.2	17.5	19.0
Australia	13.3	13.6	10.9	10.3	10.5	12.1	6.4	8.1	9.0	9.7	7.7	8.6	11.8	10.3

Source: OECD, *National Accounts, 1960-89*, Volume 1, 1989.

Appendix Table 9.—Net National Saving as a Percentage of GDP in Selected Countries, Selected Years, 1962–1989

Country	1962	1967	1972	1975	1978	1981	1982	1983	1984	1985	1986	1987	1988	1989
United States	9.1	9.7	8.8	6.0	8.9	6.4	2.7	2.2	4.4	3.3	2.2	2.1	3.1	3.2
Japan	21.7	22.2	24.4	19.4	20.0	17.9	17.0	16.1	17.0	18.0	18.0	18.3	19.2	20.0
Germany	18.6	15.0	16.0	9.6	11.4	8.0	7.7	8.5	9.2	9.6	11.6	11.3	12.4	14.1
France	17.3	18.4	17.6	13.2	13.0	8.5	7.2	6.4	6.3	6.4	7.6	7.3	8.2	8.8
United Kingdom	8.6	9.4	9.1	3.5	6.9	4.3	4.6	5.3	5.1	5.8	4.4	4.3	4.7	4.5
Italy	19.7	16.3	15.0	10.9	14.1	10.2	9.3	9.5	10.0	9.2	9.1	8.5	8.8	8.5
Canada	8.6	10.8	11.2	11.2	10.0	11.1	7.5	7.1	8.7	7.8	6.0	7.2	8.9	8.6
Belgium	12.1	14.5	15.8	12.4	11.1	4.8	4.4	5.0	6.2	5.6	7.6	8.1	10.0	11.7
Greece	14.3	14.7	22.0	16.3	18.6	16.1	8.3	8.0	6.7	4.4	4.8	4.9	8.0	5.7
Netherlands	17.4	17.9	18.3	14.0	12.0	10.4	10.8	11.2	12.9	13.6	12.7	10.5	12.4	13.4
Sweden	13.6	13.6	12.8	12.7	6.0	3.6	1.9	3.8	5.9	5.7	6.2	6.4	6.8	7.3
Switzerland	18.5	19.5	20.5	17.0	16.2	17.8	17.7	17.7	18.7	19.5	21.1	21.6	22.5	23.3
Australia	10.6	9.5	13.4	8.5	6.6	4.2	0.7	3.0	3.4	2.3	2.4	4.7	7.4	6.3

Source: OECD National Accounts, 1960–1989, Volume 1, 1991.